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VOL. 86 No. 2192

15 JULY 1961

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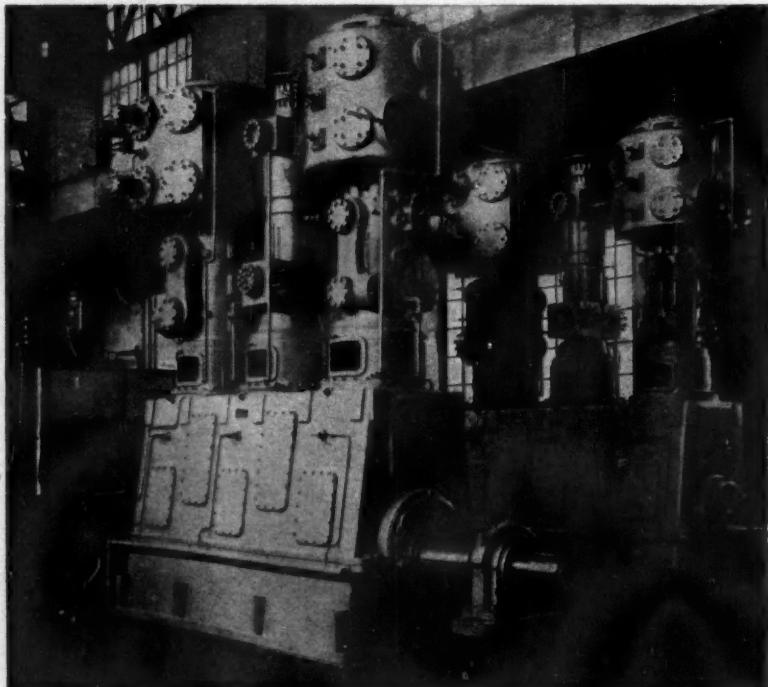
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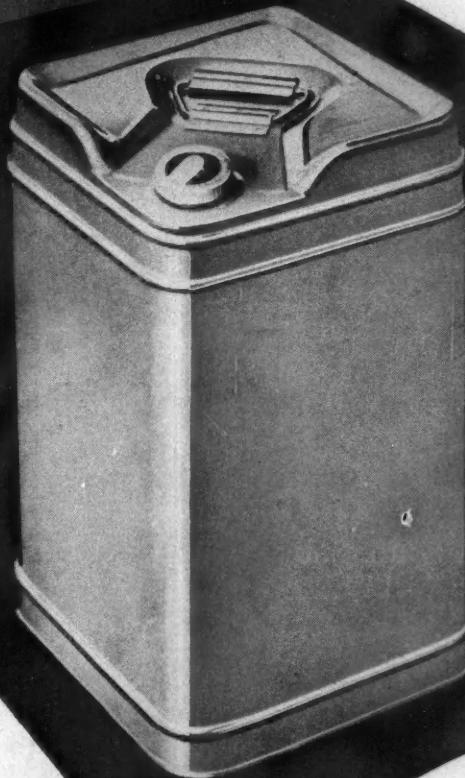
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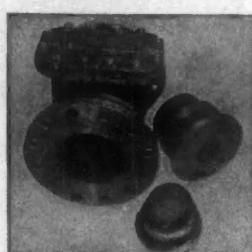
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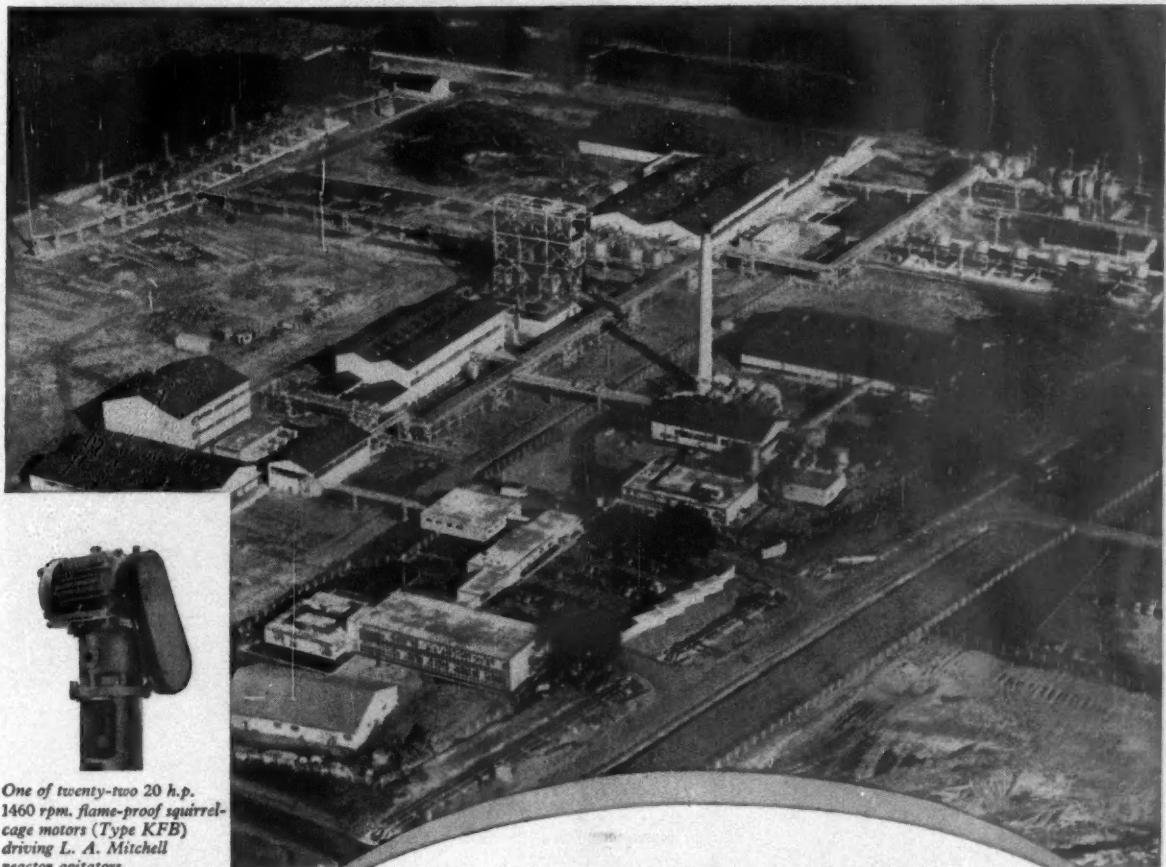
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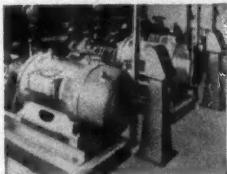
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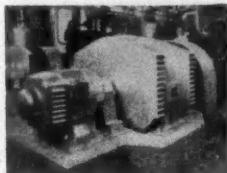
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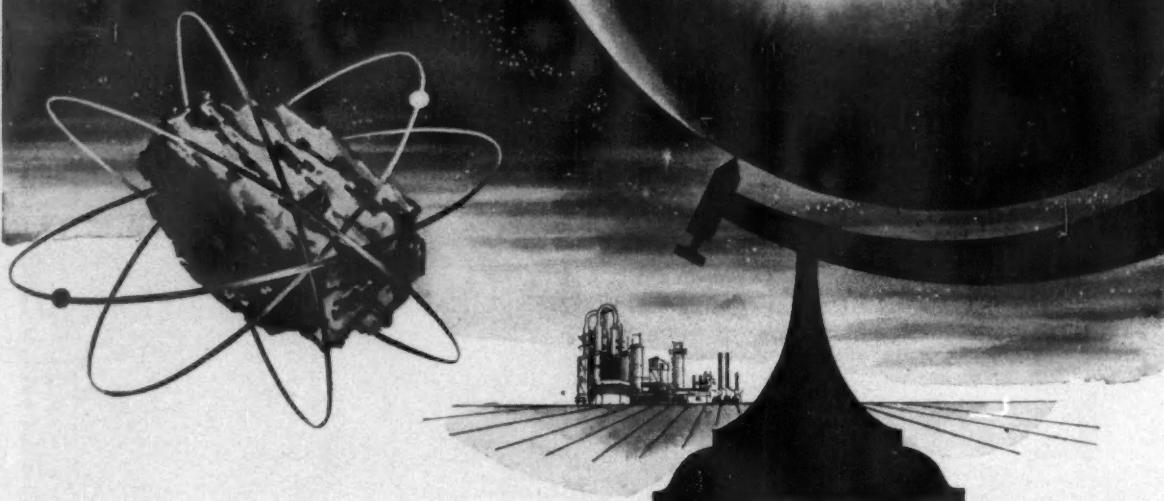
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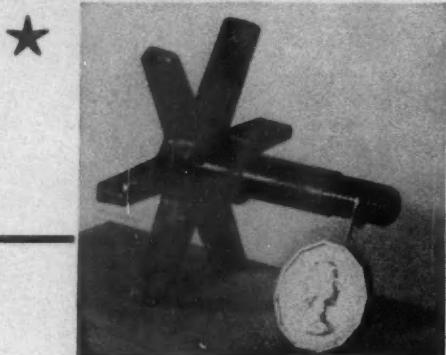


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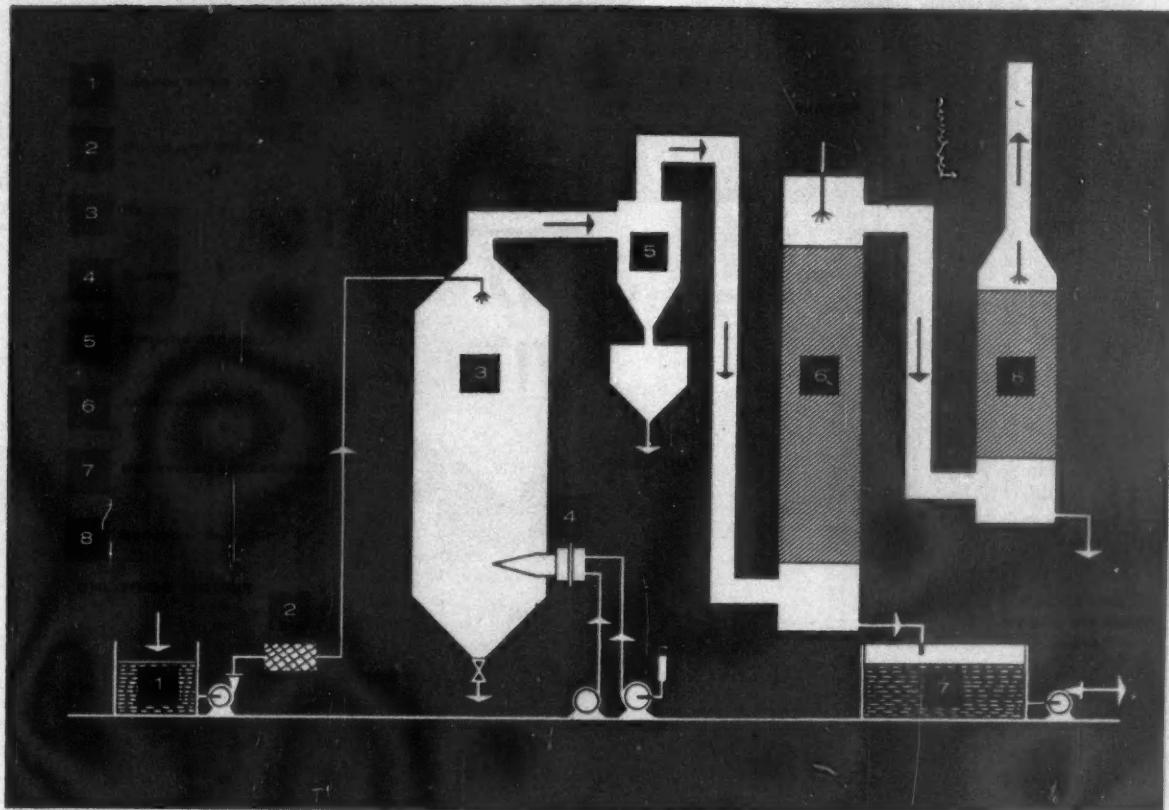
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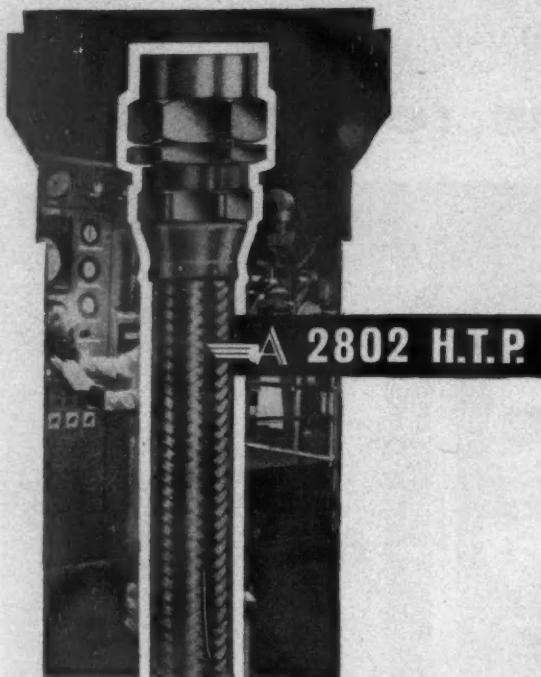
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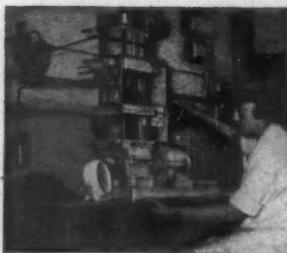
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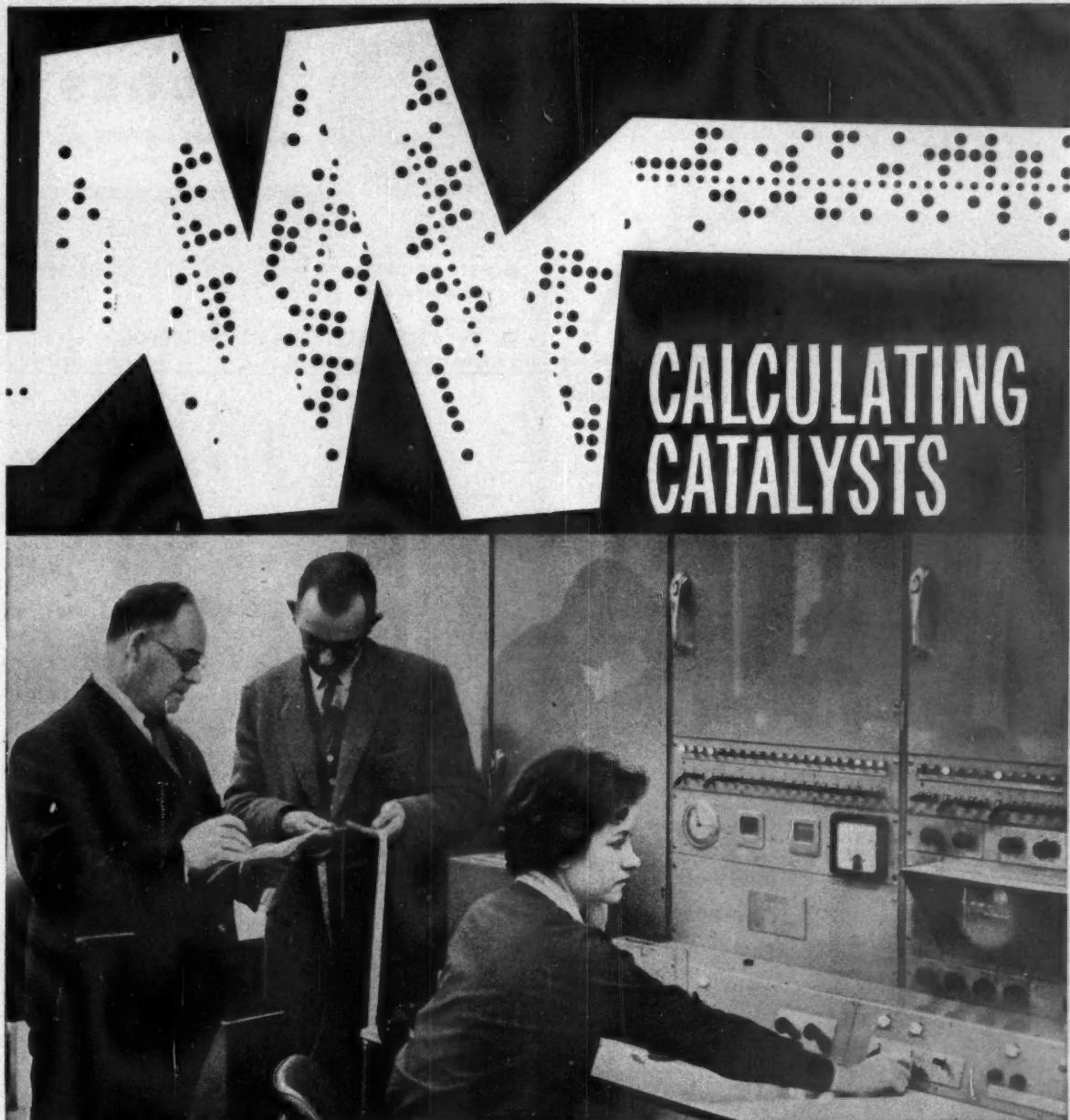
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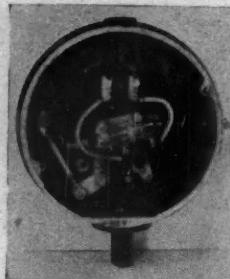
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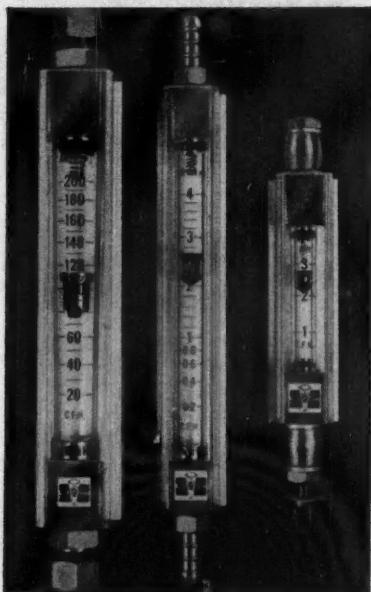
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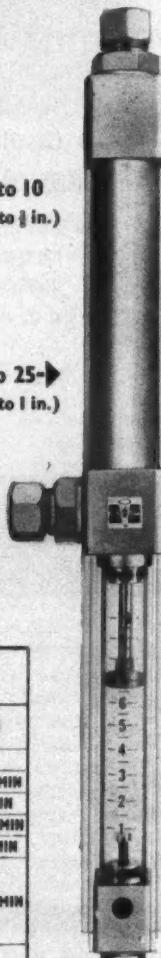
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Gapmeters are compact and inexpensive. No glass tubes larger than $\frac{1}{4}$ in. i.d. are used. The range shown below is not a complete list. Other ranges already exist for other fluids, and the selection is being continually increased.

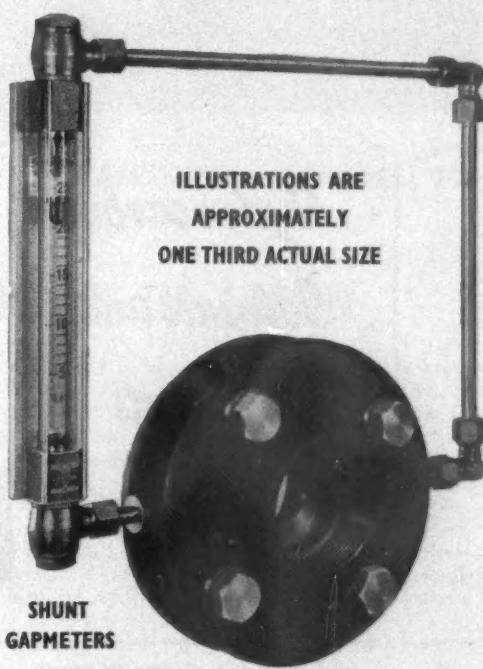


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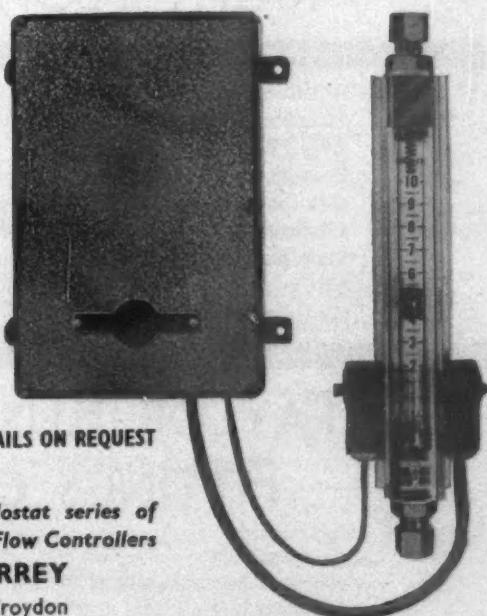
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				C.F.H. (R.T.P.)	METRIC SCALES
1	4-35/SS	A.1	385	0-1-1	7.5-75 CC/MIN
..	4-42/D	A.1	385	0-1-1	50-500
2	6-42/HS	A.2	107	0.25, 0.5, 1	1-5 LIT/HR
..	6-30/SS	A.2	107	1, 2, 3	75, 150, 225 CC/MIN
..	6-60/HS	B.2	155	0.2, 1, 2	0.1, 0.5, 1 LIT/MIN
..	6-60/D	B.2	155	0.1, 0.5, 1	50, 250, 500 CC/MIN
..	6-40/D	B.2	155	1, 2, 3	0.5, 1, 1.5 LIT/MIN
..	6-53/D	C.2	306	0.1-0.3, 0.5	50, 150, 250
6	9-65/HS	A.6	85	1-10	75-750 CC/MIN
..	9-55/SS	A.6	85	2.5-20	200-1,500
..	9-60/D	C.6	301	0.2-4	100-2,000
..	9-60/D	A.6	85	2.5-25	1-12
..	9-65/HS	A.6	85	5-50	2.5-25
..	9-60/D	B.6	182	1-10	0.5-5
10	14-50/SS	A.10	44.5	6-60	0.5-5
..	14-42/D	A.10	44.5	10-100	5-50
..	14-50/HS	A.10	44.5	20-200	10-100
15	ED	B.15	31.7	30-300	15-150
..	ESS	B.15	31.7	20-200	1.5-15
..	ESS	B.15	31.7	12-120	0.9-9
19	ED	B.19	23.5	60-600	30-300
..	ESS	B.19	18.5	50-500	3.75-37.5
..	ESV	B.19	23.5	30-300	2.25-22.5
25	ED	B.25	17.4	100-1,000	50-500
..	ESS	A.25	13.0	100-1,000	7.5-75
..	ESV	A.25	13.0	80-800	6-60

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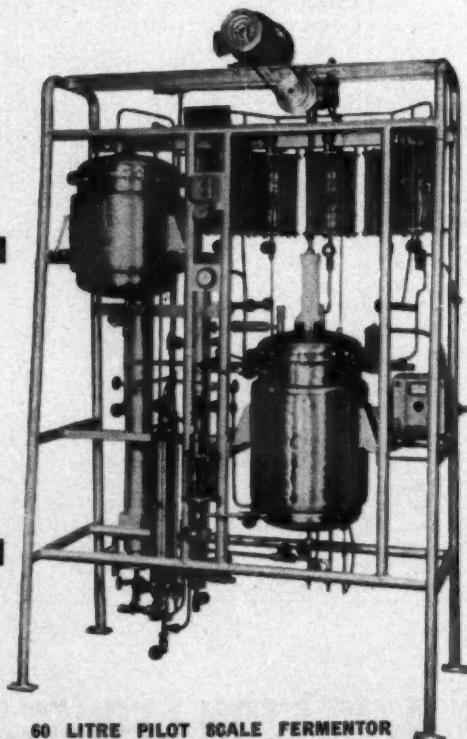
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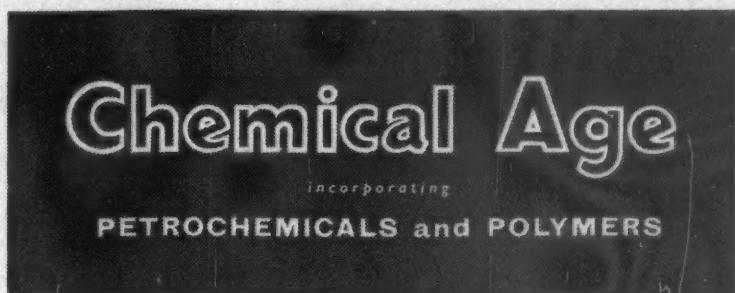
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CHEMICALS IN JAPAN

THE Japanese chemical industry is in the throes of major expansion, the aim being to move away from dependence on fertilisers, which currently account for about 30% of output, into heavy organics. In 1959, Japan's total chemical production amounted to 1,000,000 million Yen, representing about 10% of all manufacturing industry.

However, the rate of expansion in chemicals production has been far below the average of manufacturing industry—a striking contrast to Western chemical industries, which have had growth rates well in excess of other industries. Recent issues of CHEMICAL AGE, have made it clear that Japanese chemical producers have big plans for expansion into petrochemicals, plastics and fibres. Last week we reported expansion programmes of two companies which can only be described as 'grandiose'.

Recent moves into newer technologies have tended to be on massive scales and in trying to correct a state of imbalance, in which the chemical industry has leaned far too heavily on the slow moving fertiliser sector, further trouble appears to be in store. These difficulties were pinpointed in a recent White Paper issued by the Resources Investigation Council of the Science and Technical Agency as being excessive capital spending and a chronic shortage of capital.

Too many companies are trying to get on the petrochemicals band-wagon, creating excess competition and wastage of capital. Many of these newcomers lack such fundamentals as process know-how, raw materials and markets for their products.

A strenuous effort is being made to break Japan's dependence on the under-developed Far-eastern countries as export markets and to break into the more lucrative markets of the West. The Government has raised the industry's export target for 1961 from \$191 million to \$195 million, compared with 1960 chemical exports of \$151 million. Exports are not the only answer as can be seen in the case of synthetic resins. Japan ranks as the world's fourth largest producer in this field, but the three existing manufacturers have a major task if they are to boost usage of resins in their own country. At present, technical service and research are virtually non-existent.

This lack of original research is one of the biggest problems facing the Japanese chemical industry. Currently, the industry is almost 100% dependent on overseas know-how and has been buying process licences from the U.S., Britain, France, Germany and Italy. Research spending by Japanese companies is small or non-existent. For instance, in 1960, Mitsui Regaku spent 130 million Yen, or 1.1% of sales and 1/250th of Du Pont's figure of 32,400 million Yen—4.3% of turnover.

To help overcome this fundamental weakness, the Science and Technical Agency has set up the New Technique Development Organisation. Projects selected for research include the production of synthesis gas from natural gas; continuous fermentation processes; production of titanium; cement production by non-calcination; production of lithium aluminium hydride; synthetic fibre spinning; persulphate and hydrogen peroxide by the electrolysis of sodium sulphate; the production of hydrogenation catalysts by a new stabilisation technique.

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Mead Johnson Market Link Could Include Nutrition Products B.D.H. Chairman Tells Members

FIGHTING back against organised opposition amongst shareholders to the proposed financial deal with Mead Johnson and Co., the U.S. pharmaceutical concern, the chairman of British Drug Houses Ltd., Mr. Geoffrey Eley, has issued a new statement to shareholders urging them to support the Mead Johnson proposal at the extraordinary meeting of B.D.H. to be held on 17 July. He emphasises that the B.D.H. board has not received any other offer or indeed any alternative proposal. Referring to repeated rumours about B.D.H. as a 'take-over' prospect, he says: "Shareholders should not be dazzled by this prospect, because in the opinion of your whole board, including those members concerned with research and the development of new products, the long term prospects of growth and expansion are much brighter if B.D.H. remains a separate entity."

Mr. Eley said the proposed arrangement by which B.D.H. would obtain £5 million extra capital from Mead Johnson would enable B.D.H. to plan its future expansion for many years ahead without having to consider how it was to be financed. This was particularly important while the company was bringing its development schemes to fruition. He went on to say that, on present estimates, B.D.H. would need £3 million of the £5 million by the end of 1962. During the rest of the five-year period allowed for in the proposed agreement, the remaining £2 million would undoubtedly be absorbed by a number of projects, together with the need for increased working capital.

Going on to elaborate on the advan-

tages which the new link with Mead Johnson would give, Mr. Eley said that while, basically, the two companies plan to pool their endeavours in pharmaceuticals, "we also intend to discuss future association in the wider field of nutrition". He mentioned, in particular, the Metercal slimming preparation launched by Mead Johnson, and said the association could include this product if B.D.H. chose to market it here.

Mr. Eley also pointed out that Mead Johnson's 1961 research budget totals \$5 million—much more than B.D.H. can afford, but the results would be readily available to B.D.H. B.D.H. would also have opened to them new markets which U.K. firms found exceptionally difficult to enter other than by an arrangement of this sort.

As mentioned in CHEMICAL AGE, 1 July, p. 10, opposition among B.D.H. shareholders steadily mounted following canvassing, in support of an alternative proposal, by John Horn and Co., chartered accountants acting for some of the shareholders. Before Mr. Eley's latest statement reached shareholders, John Horn issued a circular which stated: "The result of recent consultations with interested parties now enables us to state that an alternative offer from a well known public company, with wide experience in the pharmaceutical field, will be made available after the election of a new board." The statement added: "Assurances have been given that the terms would respect normal voting rights and would not only maintain the earnings yield, but offer attractive prospects for continued growth."

and built by the Ministry of Works at a cost of about £260,000, meets a pressing need of the Building Research Station, whose chemical research facilities were formerly accommodated in a variety of obsolescent and sub-standard buildings scattered about the Station. The materials work at the station covers all building materials except timber (which is the concern of the Department's Forest Products Research Laboratory) and ranges from fundamental laboratory research to pilot scale manufacture of, for example, perforated bricks and lightweight aggregate. Considerable emphasis is placed on research into the behaviour of materials in use, this work demanding a knowledge of the basic physical and chemical properties of the materials.

The laboratories proper are situated on the first, second and third floors of the new building and consist essentially of completely open spaces 200 ft. by 36 ft., capable of sub-division by lightweight partitioning to any desired layout. The ground floor accommodates entrance hall and exhibition space, offices, engineering plant rooms and constant temperature chambers with ancillary accommodation.

D.C.L.'s Rights Offer Will Raise £30 Million

DETAILS of the rights issue planned by the Distillers Company Ltd. to raise finance capital spending of around £30 million over the next three years have now been announced. Projects to be covered by the money raised in this way will include facilities for synthetic rubber and extended capacities for acetic acid and carbon dioxide (see p. 89).

A total of 19,652,032 ordinary shares of 10s. each at a price of 32s. 6d. is offered to existing ordinary shareholders in the proportion of one-for-10. Profit for the year ended 31 March 1961 has not been finally ascertained, but it is estimated that group pre-tax profit will be about £33,800,000 compared with £32,143,839 earned in the previous year. A final dividend of 8½% will be paid on ordinary, making 13½% for the year.

In the past, D.C.L. have followed a policy of financing development to a substantial degree by way of retained earnings. It is not intended to depart from this policy, but the number of projects now contemplated make it necessary to raise additional capital.

Record Attendance at 1961 Achema

The Deutsche Gesellschaft für Chemisches Apparatewesen, organisers of the Achema Congress 1961, held in Frankfurt-am-Main, W. Germany, from 9-17 June, report that the total number of visitors, representing 56 countries, and including the exhibiting members and single day visitors, was 134,266. Some 1,388 firms, publishers and research institutions from 17 countries exhibited. The technical meetings connected with the exhibition included 160 scientific and technical papers, while 62 educational and research films were presented.

New Chemical Research Laboratories for Building Research Station

THE powerful pressure being brought to bear by the chemical industry in getting the newer, unconventional materials of construction accepted by the building trades was referred to by Sir Harry Melville, K.C.B., F.R.S., secretary of the Department of Scientific and Industrial Research, when he opened the new Materials Laboratory of the D.S.I.R. Building Research Station at Garston, Watford, Herts, on 7 July. He pointed out that many of the new developments in building materials stem from the production of synthetic organic materials such as plastics, foams, fibres and elastomers, though equally new inorganic materials come into the picture. The chemical industry was by far the fastest growing industry, in the U.K. and elsewhere, and was determined to find mar-

kets for its products. Prices continued to fall to levels thought once to be impossibly low. These products were usually based on petroleum which may cost about £10 a ton. They were produced in large continuously operating plants which had to be employed at full capacity in order to amortise the high capital cost. These powerful pressures were all to the benefit of the building industry and while some of the experiments might not always be successful the probability was that these developments would continue, and it was better to face up to them now rather than later. The new laboratory, Sir Harry added, would be in a particularly favourable position to examine these developments.

The new laboratory building, designed

Project News

D.C.L. Plan Synthetic Rubber by Improved Route

PRODUCTION of synthetic rubber and an increase in the capacity of their large acetic acid plant now under construction are planned by the **Distillers Company Ltd.** An improved method for synthetic rubber has been developed by the D.C.L. Research Department at Great Burgh. No details are at present available as to the type of rubber to be produced, the capacity planned or the site. An announcement is expected within the next few weeks.

In addition to the acetic acid expansion at Hull, D.C.L. are also considering capacity increases for certain other manufacturing units at Hull. Extra capacity will also be required to meet the further growth expected in sales of carbon dioxide. A considerable number of other projects are envisaged, each involving smaller capital spending, but offering the prospect of a satisfactory return.

This planned expansion to be programmed over the next three years will need additional capital of around £30 million—this sum will be raised by a rights issue (see p. 88).

Although the type of rubber involved is not yet disclosed, Distillers will have substantial supplies of the necessary raw materials. British Hydrocarbon Chemicals Ltd., jointly owned by D.C.L. and British Petroleum, have just completed a second butadiene plant at Grangem-

outh, boosting capacity to 20,000 tons/year. Both the Grangemouth plants were built by Stone and Webster Engineering Ltd., who are handling a new B.H.C. butadiene unit at Baglan Bay, South Wales, which is due on stream next year.

Recently, Forth Chemicals Ltd. (two-thirds owned by B.H.C. and one-third by Monsanto Chemicals) have brought a 30,000 tons/year extension to their Grangemouth plant on stream, raising capacity here to 50,000 tons/year. A new 50,000 tons/year styrene unit is under construction at Baglan Bay, which by next year will give Forth Chemicals a total capacity of 100,000 tons/year. Design and engineering is by Monsanto Chemicals.

The £2 million acetic acid plant at Hull is due to come into operation early next year. Constructors are the Lummus Co. Ltd. and the process is a D.C.L.-developed one, which has recently been licensed to Dainippon Kasei Co., Japan.

Other projects in hand by D.C.L. and their associates are: B.H.C., methanol at Grangemouth; ethylene dichloride at Grangemouth and Baglan Bay; ethylene and propylene at Baglan Bay; Grange Chemicals, *o*-xylene-based phthalic anhydride plant at Hull; British Geon Ltd., extension to p.v.c. completed mid-1961, a further large expansion now in hand; and Distrene Ltd., large expansion to polystyrene capacity.

I.C.I.'s £7 m. Acrylic Plastics Project for Rotterdam

PLANTS for the manufacture of Perspex acrylic sheet and Diakon acrylic moulding powder, as well as methyl methacrylate, from which they are made, are to be erected in Europe by Imperial Chemical Industries Ltd. at a cost of some £7 million. This represents the first step in I.C.I.'s plans to build a petrochemical project on a 300-acre site at Rotterdam at a cost of £100 m., and for plants elsewhere in the European Economic Community area (CHEMICAL AGE, 4 March, p. 356).

Main investment for the methyl methacrylate-Diakon-Perspex project will be on the Rotterdam site, but it is understood that the exact location of the Perspex sheet plant has not yet been fixed. Subject to the approval of the British, Dutch and other authorities concerned, construction is expected to start this year and it is planned to have some of the plants in production by the end of 1963. Contractors have not been named but it is expected that much of

the equipment will be supplied by Dutch firms.

Capacity for methyl methacrylate will be about 20,000 tons/year; capacities for Perspex and Diakon will amount to several thousand tons each. The plants will employ about 500 personnel, mostly local labour. Raw materials will be obtained from E.E.C. countries. The I.C.I. process for methyl methacrylate manufacture involves reacting acetone cyanohydrin with 98% sulphuric acid to produce methacrylamide sulphate, which is then treated with methanol to make methyl methacrylate.

Perspex, available in a wide range of colours and sheet sizes, is already sold in substantial quantities in Europe. A major outlet is in signs, but it is also used extensively for glazing (e.g. roof lighting), display and advertising applications. Diakon acrylic moulding powder, also available in a wide range of colours, has so far found its widest use in component parts for the automotive and

radio industries, but sales are expected to expand rapidly in many moulding applications where good performance and outstanding appearance are required. These include such items as television implosion guards and hand telephone sets.

I.C.I. have declared their intention of making every effort to enlarge their market in Europe for these materials before the new Continental projects are completed, by supplying the products on a much increased scale from their U.K. production.

British Celanese Aromatics Plant Near Start-up Date

● NEW aromatic solvents plant of **British Celanese Ltd.** at Spondon, Derbyshire (see CHEMICAL AGE, 12 November 1960, p. 813) will be on stream by mid-September, according to the latest announcement by the company. The plant will make substantial quantities of toluene available and the company have appointed sales agents (see 'Trade Notes').

Design and erection of the Spondon plant, which brings British Celanese (of the Courtaulds Group) into the aromatics field for the first time, was assigned to the Chemical Engineering Division of the **A.P.V. Co. Ltd.**, Crawley, Sussex. A.P.V. are also responsible for civil and electrical engineering and commissioning.

Solvent Extraction Plant for Bibby

● PLANT for the solvent extraction of soya bean and other oil beans is to be furnished by **Blaw Knox Chemical Engineering Co. Ltd.** under a contract from **J. Bibby and Sons Ltd.** The plant, to be constructed at Liverpool, will supersede an existing solvent extraction plant, and the programme, which is scheduled for completion by March 1962, will be so arranged as to minimise interference with existing production. This type of project is one in which the Blaw Knox organisation have specialised over a number of years, and their experience will be used for all aspects of the present contract.

Ammonia Complex for I.C.I. Australia

● WHOLLY-OWNED subsidiary of I.C.I., **Imperial Chemical Industries of Australia and New Zealand**, are to build a five-unit complex at Botany for the production of ammonia, ammonium nitrate, methanol, nitric acid and urea. The first unit is expected to be in operation in 1963. Total production of all units will be 63,000 tons a year. The cost of the project will be about £6 million.

Taylor Woodrow to Build River Tay Gas Pipeline

● CONTRACT, worth £100,000, to lay a gas pipeline across Tay railway bridge at Dundee for the **Scottish Gas Board** has been awarded to **Taylor Woodrow Construction Co.**, London. The pipeline will form part of the Scottish distribution system for the gas produced in the

S.G.B.'s Lurgi gasification plant at Westfield. The contract, on which work has already begun, and which is due for completion by the end of October, includes the engineering, design and construction of the 2-mile pipeline, which will be 12½ in. outside diameter pipe of high-pressure welded steel.

Drug Factory for Ireland

A FACTORY to produce range of pharmaceutical, cosmetic and hairdressing products has been opened in Dublin by the Warner-International Group, one of the world's largest drug producers. Built at a cost of about £50,000, the factory will be operated by a recently formed company, Warner-Lambert (Ireland) Ltd., and will supply the Irish market with products previously supplied from the Group's £2 million plant at Eastleigh, Hants, operated by William R. Warner Ltd. It is also planned to develop exports from Ireland to overseas countries, particularly in the Middle East. The present factory is capable of expansion to three times the size, making a total investment of about £150,000.

Products of the factory include Nardil anti-depressive drug, Agarol and Anusol depositaries, Sloane's linament, Gelusil

antacid, Peritrate (for coronary artery diseases) and other drugs in addition to hairdressing preparations. Eventually the full range of the Group's products will be produced at the factory, a feature of which is the laboratory which is unusually large and well equipped for a factory of such a size, and will carry out research as well as quality control.

Marchon's Italian Surfactants Plant in Operation

Now in production in Castiglione delle Stiviere (Mantova), Northern Italy, is the new plant of **Marchon Products Ltd.**, Whitehaven, Cumberland, which will be operated by their totally owned subsidiary, Marchon Italiana S.p.A. The plant has been designed for the manufacture of surface active agents for industrial and cosmetic uses, "and will be concerned with the introduction of high quality raw materials into that sector of the Italian market". Almost the whole Marchon range of products will be manufactured in Italy, with the exception of household detergent powders, sodium tripolyphosphate and fatty alcohols.

The new factory has been built on a 20-acre site bordering the Brescia-Mantova highway.

Distillers Complete Antibiotics Processing Factory at Liverpool

A CRYSTALLISATION plant, which introduces new automatic techniques for processing antibiotics, and an extraction plant have been completed by the Distillers Company (Biochemicals) Ltd. at Liverpool. This project has cost over half a million pounds and has taken two years to complete. A new pharmacological research laboratory has also been built to increase the company's facilities for screening new substances, including the latest synthetic drugs, and to test existing projects. Distillers are among the leading makers of penicillin, streptomycin and other antibiotics.

The new production plant features elaborate arrangements for sealing off the sterile area from the production area. The equipment units have installed in such a way that all the motors, the drive gear and most of the complicated control mechanisms are sited outside the sterile area of the building. The plant will use over 10,000 gall./week of a pyrogenic distilled water, mainly for washing down equipment.

The equipment is claimed to be the very latest of its kind, some of it supplied by other countries but most of it specially designed and produced in the U.K. The crystallisation building has been designed to permit major extensions or modifications to plant without altering the basic construction of the plant itself. This unusual flexibility will enable the plant to be realigned quickly should the occasion arise.

A further feature of the plant is the

attention that has been given to safety in dealing with the large volumes of inflammable solvents used. Most of the solvents are produced within the Distillers Group.

The plant was designed jointly by Distillers engineers and technical personnel of Distillers Co. (Biochemicals). Contractors included Mason and Morton Ltd., R. A. Brand and Co. Ltd., Sturtevant Engineering Co. Ltd., Spectra-Glaze International Ltd. and Crofts Engineers.

U.S.S.R. Builds 30 Chemical Plants a Year

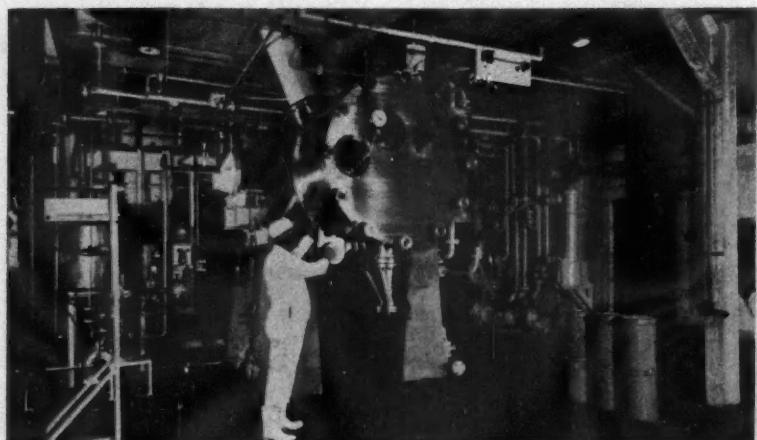
THE chairman of the State Chemical Committee of the Soviet Union's Ministerial Council, Mr. Viktor Fyodorov, has stated that 60 new chemical plants were brought on stream in the Soviet Union over the two years 1959 and 1960. Research activities had increased to 3.4 times the former level over the same period, eight new scientific research institutes, 34 institute branches and numerous "construction bureaux" having been opened in chemical industry centres.

Low-cost Unit Grows Zinc, Lead, Tin Crystals

Single crystals of zinc, lead, tin metals, and silver chloride were successfully grown with an economical, easily operated, Bridgman-type apparatus described in a report, IS-178, issued by the U.S. Department of Commerce, Office of Technical Services, Washington 25, D.C. Costing approximately \$500 to construct, the apparatus passes the melt through a steep temperature gradient. It utilises crystallising crucibles made of quartz and graphite, all of which have 50° conical nucleating tips. The removal of the single crystals is facilitated by tapered walls on the graphite crucibles. Sizes of the crystals produced with the equipment varied from $\frac{1}{2}$ to $\frac{1}{4}$ in. in diameter and up to $3\frac{1}{2}$ in. long.

Fat Research Congress

The 6th Congress of the International Society for Fat Research is to be held at the Imperial College of Science and Technology, London, S.W.7, on 9-13 April 1962. Application forms for provisional registration of membership and for submission of paper may be obtained from the Congress secretaries, Dr. F. Bradley and Dr. H. Jasperson, 14 Belgrave Square, London, S.W.1.



At the Liverpool factory: section of the extraction plant used for production of crude intermediates which are subsequently processed in the crystallisation building to sterile pure antibiotics

S.C.I. Annual Meeting

Lord Fleck Outlines Plan to Raise Membership and Increase S.C.I. Scope

ATWO-POINT plan to attract students of the chemical industry to the Society of Chemical Industry and proposals to extend the Society's activities into investigational work, including a study to define the term 'chemical industry', are to be put to the council by Lord Fleck, president.

Now that the decline in membership over the past 10 years has been halted, Lord Fleck seeks ways of increasing membership in a much more striking way than the small rise recorded in 1960. In his presidential address, which followed the annual meeting held in the University Museum, Oxford, on Tuesday, he reviewed the Society's progress in its 80 years of existence.

Attracting Students

As far as attracting young members to the S.C.I. is concerned, Lord Fleck will ask the council to consider appointing representatives to each of the nine colleges of advanced technology so that the Society can be brought to the notice of the students. In agreement with the appropriate professors, it is Lord Fleck's hope to place at their disposal a year's free subscription to the S.C.I. journal; this would involve 54 annual subscriptions, which would be hoped create a reasonable amount of interest in the work of the Society.

It would not be possible to do this for all the 466 technical colleges in the country, but Lord Fleck assumed that of the 2,500,000 students, most of those following chemical courses would enter industry. To ensure that the Society was a continuing force in industry, early and increasing attention should be paid to that concentration of students.

Under its Charter, the Society was charged with the responsibility of "causing to be made or assisting in the making" of investigations, studies and reports on novelties, processes, etc. Lord Fleck said that Kestner had demonstrated his process for the electrolysis of brine through the S.C.I. That was not what he had in mind; he did not think that investigations into reactions would be appropriate. However, he is to ask the council to consider if the Society is developing it to the full its spheres of interest. He feels that questions for study are those of the broadest character.

In this respect, he instanced the possibility of studying atmospheric pollution. He also thinks it might be profitable for the S.C.I. to employ statisticians or economists to evolve a definition of the 'chemical industry' that could command a wide measure of acceptance, or

perhaps to devise a few different definitions to suit varying occasions.

The S.C.I. annual conference started with a reception at Rhodes House, Oxford, on Monday evening, followed by a reception in the Town Hall on Tuesday and the S.C.I. annual dinner at Keble College on Wednesday.

Papers were presented as follows:

*Physical methods applied to archaeo-

logy", by Dr. E. T. Hall; 'Medal Address', by Professor Sir Cyril Hinshelwood, F.R.S.; 'Analytical chemistry—science or art', by Professor H. M. N. H. Irving; 'Problems of drug research', by Dr. F. L. Rose, F.R.S.; 'Chemical research in the development of gas-cooled reactors', by Dr. R. Spence, F.R.S.; and 'Hole and corner chemistry', by H. M. Powell, F.R.S.

Membership Decline Has Been Halted, Latest S.C.I. Figures Reveal

THE decline in S.C.I. membership over the past nine or 10 years—at a small but serious rate amounting to about 11% over the period—has been arrested and 1960 showed a slight rise of 0.1% in total membership. This was stated by Dr. H. K. Cameron, hon. secretary for home affairs, at the annual meeting.

Dr. Cameron declared that the rapid growth in scientific and technical activity had led to an increase in the formation of new societies, the proliferation of which was today a matter of considerable alarm. Some societies were meeting this situation by amalgamation or by linking together to cater for new branches of science. He believed that so far as the

chemical industry was concerned, the S.C.I. provided the most excellent compromise that could be found by the development of product groups, the number of which was increasing yearly. (The next to be set up will cover industrial water.) In the S.C.I., these groups had a great liberty of action and autonomy to develop individually, while remaining within the framework of the Society.

Dr. J. Ferguson, hon. treasurer, reported a healthy financial position with a 1960 balance of £10,590, compared with £1,640 in 1959. No publications grant had been necessary from the Chemical Society, and the publications account showed a profit instead of a loss.

New Rubber De-bonding Plant Saves Space, Prevents Fouling

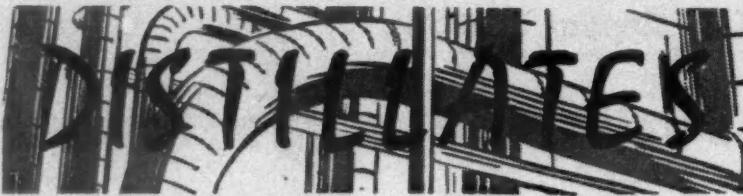
COMPACTNESS, a special arrangement to prevent fouling of the vapour pipes and provision for emptying the retort to be emptied while hot are features of a Holmes-Andre rubber de-bonding plant recently installed at the Hemel Hempstead, Herts, works of the Empire Rubber Co.

The plant, of 4 cu. ft. capacity, operates on the same principle as earlier plants of this type (destructive distillation in a closed vessel) but has a number of new design features. Thus, to overcome fouling of the vapour pipes, the double ended 1 h.p. motor which drives the airblower also drives a pump which circulates distillate oil throughout the system. This not only irrigates the off-take piping, but also washes the rubber vapour in a scrubber cooler and maintains

a constant level in a seal tank. A built-in rodding device is incorporated for the short section of pipe that cannot be irrigated.

The plant is accommodated on a rectangular base platform occupying an area of only 48 sq. ft. Installation of this type of plant is simple, the only requirements being a gas or oil supply for heating the retort, water services and an electric supply. Addition of a small bore low pressure steam supply enables the retort to be emptied while hot; this has the advantage of reducing operating times and saving fuel.

Temperature control is incorporated, this being essential when dealing with aluminium and similar easily distorted metals.



★ DISTILLERS will have little difficulty in raising their £30 million by way of a rights issue. So far as their Industrial Group is concerned, they have a first-class organisation, backed by a sound research and development group.

The news, disclosed in 'Project News', that D.C.L. have developed an improved route to synthetic rubber, which is to be exploited commercially, has been a well-kept secret, although the fact that they have ready access to mounting supplies of the necessary raw materials, has led to much speculation over the past few years.

Distillers seem to have found the happy approach to the development of their petrochemical activities, both as regards investment and research. The investment load is spread through a large number of joint ventures involving British Petroleum, Monsanto Chemicals, California Chemical, B. F. Goodrich, and Dow Chemical. In some of these cases, the foreign partner has supplied the process know-how, while in others, it has come from plant constructors. D.C.L., however, have avoided the dangers of being too dependent on others for their technology. From the Great Burgh Research Department have come processes for cumene-phenol, acrylonitrile, acetic acid and now synthetic rubber.

What a different story to that portrayed in our leader this week!

★ TECHNICAL conferences have their lighter moments, as the house magazine of Midland Tar Distillers Ltd. points out in quoting the following contribution to a recent conference:

"In our organisation it is often difficult to decide whether a research chemist is concerned with a solution of the problem or whether he is merely a part of the problem."

★ I CAN well recommend readers to visit the Soviet Exhibition in London. Apart from a bevy of beautiful models—more like the Bluebell girls of Paris, than the cartoonists' conception of Soviet womanhood—the display of chemical and process technology is as fine as I have seen anywhere.

The most spectacular of several plant models is that devoted to a Soviet-developed two-stage process to butadiene from butane. Although equipment demands are heavier than current one-stage processes, the technology is claimed to be much simpler and plant economics to be at least comparable. This process is one of many which it is hoped will interest western producers.

Meanwhile, I learn from Sojuzchimexport, the Soviet organisation for chemical imports and exports, that the U.S.S.R. is particularly keen to expand sales to the U.K. of coke-oven products and naval stores, plus essential oils and aromatic substances for perfumery and cosmetics; as well as perfumery articles as such. As far as imports from the U.K. are concerned, the Soviet Union seeks all types of plastics materials, plus chemi-auxiliaries for the rubber, textile, and other industries, dyestuffs and intermediates, etc.

The head of Sojuzchimexport tells me that delivery dates and other conditions are agreed on by discussion in each case and that as a rule, such terms do not differ much from those usually accepted in commercial practice.

★ BACK home in Budapest after completing the Herculean task of supervising the building of a big chemical and dyestuffs factory in North Korea is—an attractive 35-year-old woman. Vera Huszti, whose official title is chief engineer of the export department of the Ministry of Metallurgy and Machine Industry, was barely 30 when she was put in sole charge of the design, building and equipment of the factory, the plant for which was fabricated in Hungary and erected in North Korea.

The factory is designed to produce some 1,000 tons/year of phthalic anhydride, 1,000 tons of chlorobenzene—most of it for a subsidiary DDT plant



Chemical project supervisor Vera Huszti finds time to supervise her son's homework as well

—and 900 tons of various sulphur dyes. Vera Huszti's job included the planning of the manufacture of the equipment and instruments, the training of Koreans to run the plant, and the control and instruction of Hungarian engineers who built and put the plant into operation.

Vera began training as a chemist early in life and, while still an undergraduate, did research work in one of the chemistry institutes of the Budapest Polytechnic University. Then she took up investigation of industrial processes in one of the chemical industry's research

institutes. From there she developed an interest in organisation and planning and spent two years on this sort of work in a Hungarian chemical combine. There her work was noticed by Government officials dealing with contracts for erecting factories abroad.

Which more or less brings us up to date about this remarkable young woman, except that, somehow, in the midst of all this, she found time to marry, to have a son (now 10) and to become fluent in five languages.

★ THERE is one aspect of the work of the Laboratory of the Government Chemist, I learn from the annual report (see also p. 96), which is practically unique in D.S.I.R. stations and that is the extent to which it is involved in legal cases. While in many instances the Laboratory certificate of analysis is accepted, there are others where members of the staff have to attend court to give evidence in support of their reports. During 1960 there have been 80 cases concerned with forgery, dilution of beer, manufacture of illicit spirit, possession of uncustomed goods, opium or other dangerous drugs and infringement of the Merchandise Marks Act particularly in connection with the misdescription of textiles.

Apart from the detection of forgeries by means of infra-red photography and the use of selective colour filters, the Laboratory is receiving an increasing number of requests for an opinion on the authorship of handwriting. As this can never be completely proved by scientific measurement and evaluation, handwriting evidence is frequently searching questioned by the defence.

The life of a Government chemist certainly doesn't lack variety, for it seems that, after hobnobbing with the Customs and Excise, messing about with detergents and sewage, and an odd visit or two to the local court, he might well be asked to nip along to Hyde Park just to check that it is no more unsafe than usual to bathe in the Serpentine.

★ ALTHOUGH dichlorodifluoromethane is usually very stable, workers of the Du Pont Freon division have found that it can react dangerously with molten aluminium. A white-hot, self-sustaining reaction is produced when molten aluminium is dropped into the liquid chlorofluorocarbon.

It appears that, with chlorofluoromethanes and aluminium, the heat of reaction increases with increasing fluorine content. The reaction with trichloromonofluoromethane is much slower and lasts for only a few seconds. Iron, nickel, chromium, zinc and copper produce the opposite effect. With these metals, the heat of reaction decreases with increasing fluorine content.

Alembic

PROPYLENE OXIDE SHOWS MAJOR GROWTH

U.S. Experience Points to World Market Prospects

IMPELLED by the growing demand for propylene glycol and polyglycols in the production of polyurethanes, propylene oxide is currently in a major growth phase. To meet the growing requirements for this epoxide, two approaches are taken: world-wide construction of new propylene oxide facilities, and conversion of ethylene oxide plants based on the chlorohydration process to the manufacture of propylene oxide. The latter approach provides a means for effective utilisation of these facilities as an increasing portion of ethylene oxide synthesis is shifted to direct oxidation processes.

The growth prospects for propylene oxide and glycol may be gauged from experience in the U.S. economy. Output of the oxide rose from 80 million lb. in 1955 to 300 million lb. in 1960, and is expected to continue at an average growth rate of 5% per year. Significantly, the biggest single jump occurred between 1958 and 1959 when propylene oxide consumption rose by nearly 100 million lb. (output during the same period rose by 150 million lb.; the difference is due to inventory variations).

Biggest single outlet for propylene oxide is production of propylene glycol, currently a fast-growing commodity as is also the second largest consumer, the polypropylene glycols. A breakdown of the U.S. market for propylene oxide in 1960 shows the major part of these commodities played in the overall demand:

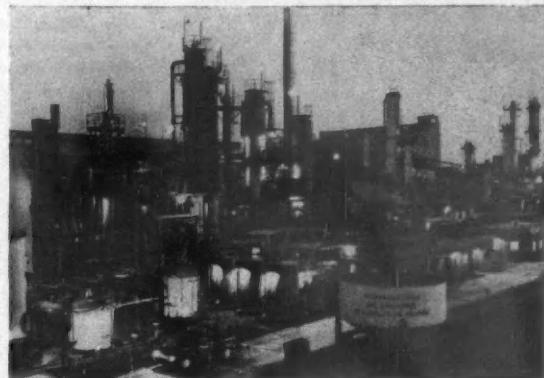
	%
Propylene glycol	54
Propylene glycols and oxide adducts	32
Surface active agents	4
Miscellaneous	10

Propylene glycol, which has experienced significant market expansion of its own, has been primarily responsible for the significant increase in demand for propylene oxide. Consumption of the glycol rose steeply from 65 million lb. in 1955 to 154 million lb. in 1960, and is conservatively expected to reach 190 million lb. by 1965. The future rise will be largely due to consumption in polyesters, plasticisers, and Cellophane, and will result in major shift of end-use pattern:

	End-Use Pattern of Propylene Glycol	
	1960	1965
	%	%
Polyethers and polyesters	31	43
U.S. P. Grade	22	19
Cellophane (humectant plasticiser)	17	16
Plasticisers	7	9
Export	14	5
Brake fluids	4	3
Miscellaneous	5	5

Biggest single expansion in demand for propylene oxide and its derived

Wyandotte Chemical Co.'s propylene oxide plant



glycols will undoubtedly be related to the growth of urethane polyethers. Flexible urethane foams, which consume an average of 0.6-0.7 lb. propylene oxide per lb. of resin, are expected to rise from 93 million lb. in 1960 to 185 million lb. in 1964. No less important are new developments in urethanes whose scope is very large, though still undefined. Among them: production of polyurethane rubber, expected to rise from nil to at least 10 million lb. by 1965, polyurethane textiles which are new on the market and are forecast to reach more than 15 million lb./year by 1965, and the attractive new line of polyurethane paints.

Very important also is the use of propylene glycol in production of fast-growing polyesters, mostly required in reinforced plastics. One recent estimate predicts U.S. rise in reinforced plastics from 250 million lbs. in 1960 to 475 million lb. in 1965. Some 20-22% of this total weight is propylene glycol. In this area, however, competitive polyhydric alcohols are making inroads on propylene glycol demand.

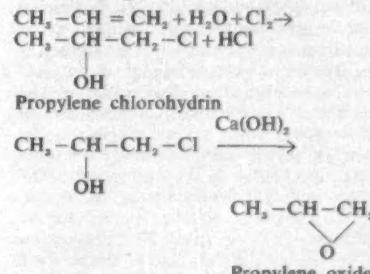
Polypropylene Glycols

Polypropylene glycols and their ethers will also take part in the anticipated rapid growth of polyurethanes. Other outlets for these products are in the production of hydraulic fluids, cutting oils and plasticisers. Mixed ethylene propylene polyglycols serve in the production of specialty surface active agents and synthetic lubricants.

In addition to the major uses for propylene oxide is production of specially non-ionic surfactants and of propanolamines. Considerable interest is also shown in stereospecific polymers of propylene oxide. An isotactic group, which shows good crystallinity and high molecular weight (up to 500,000), is being considered for production of fibres and plastics.

Technical Aspects. With the exception of some 8 million lb./year obtained as a co-product in Celanese Corp.'s non-catalytic vapour-phase oxidation at Bishop, Texas, the world's entire production of propylene oxide is based on

the chlorohydration route, as shown by the following:



The chlorohydration reaction is carried out in the liquid phase by reacting chlorinated water with propylene in about 25-30% excess. The reaction is carried out at 40-50°C and at essentially atmospheric pressure. To minimise formation of by-product propylene dichloride, concentration of free chlorine must not exceed 0.5 g./litre at any point in the reactor.

Key to successful reactor design is, therefore, twofold: avoidance of direct contact between propylene and elemental chlorine, and maintenance of a low chlorine propylene ratio at all points in the system. Several designs are in operation. Probably the most popular kind of chlorohydration reactor involves internal recycle of the aqueous medium.

A reactor of this type consists of a main column and a side leg which are joined into a single loop. Both legs of the loop are filled with reaction liquor. Space is provided at the top of the main column to separate tail gas from the liquid phase.

In this system, propylene is introduced into the bottom of the main column. In the course of passage through the reactor, part of the gas is converted. The remainder provides a gas lift, and also liquid movement from the reactor body to the top entrance of the side leg through which it is recirculated. Chlorine is fed into the recirculation leg. A stream of reactor product is withdrawn just preceding the chlorine feed point.

Even under the best conditions, forma-

tion of some propylene dichloride is unavoidable. If this compound is permitted to build up in the reaction space, it will form an organic phase which will favour production of more propylene dichloride. Formation of this second phase can be avoided by operating with a feed gas containing less than 45% propylene. The inert gas then acts as carrier for the dichloride. At the same time, it enhances the gas lift action in the converter. By-product propylene dichloride constitutes a downgrading in product value. However, it does have some markets, notably as solvent for greases, rubbers, and resins, as fumigant, and as alcohol denaturant.

Saponification of propylene chlorhydrin to propylene oxide is achieved by reaction of the crude, degassed product of the chlorhydrin reactor with calcium hydroxide. Lime is supplied as an aqueous slurry containing about 10% CaO. It is used in sufficient excess to provide a pH between 8 and 9 at the exit from the saponification reactor.

Two types of saponifier—a horizontal and vertical reactor—are known to be in commercial operation. The former is in essence a baffled horizontal cylinder with a superimposed dephlegmator. The combined chlorhydrin and lime stream enter the reactor in which they pass through several temperature zones ranging from 90°C to boiling point. The lower initial temperature is chosen to prevent foaming of the system due to excessive reaction rates. The conversion is completed at the higher temperature levels. Operating pressure is only slightly above atmospheric.

Product propylene oxide is withdrawn as vapour-phase product and is re-

covered by passage through a partial condenser. Impurities are chiefly propylene dichloride plus some allyl alcohol and propylene chlorhydrin. Purification is by fractionation.

Overall yield of propylene oxide from propylene is about 80-85% of theory.

Oxidation Processes. While the partial oxidation of ethylene over silver catalyst has, in recent years, assumed pre-eminence over the chlorhydrin route to ethylene oxide, no parallel development is in sight for propylene oxide manufacture. The silver-catalysed air oxidation of propylene leads almost exclusively to carbon dioxide and water formation; there is no known catalyst which will promote significant formation of propylene oxide in the vapour-phase oxidation of propylene. Non-catalytic vapour-phase oxidation of propane-propylene mixtures has been investigated; 11.5-13.3 moles propylene oxide per 100 moles propylene converted was the highest record reported yield.

Somewhat more promising is the air oxidation of propylene in the liquid phase. One such approach carries out the conversion in benzene (thus creating a serious potential operating hazard), uses manganese propionate as catalyst. Best reported yield of propylene oxide plus its glycol is about 40% on hydrocarbon consumed. This is still well below the 65-68% yield achieved in ethylene oxide production. Furthermore, the product of liquid-phase propylene oxidation is highly complex and difficult to separate. To summarise, the oxidation of propylene has not yet been developed to the point where it offers a commercially attractive route to propylene oxide.

U.S. Theoretical Study Throws New Light on Structure of Polymer Crystals

AS part of a long range programme involving the dielectric properties of polymers, workers at the U.S. National Bureau of Standards have investigated the fundamental characteristics of these materials from a theoretical point of view.

Certain polymers, such as polythene, are deposited from dilute solution in the form of very thin, crystalline platelets. These are built up of folded polymer chains. The folds themselves actually form the large upper and lower surfaces of the platelets. The chain axes of the unfolded portions of the polymer molecules are roughly perpendicular to the plain of the chain folds. This is a vastly different structure to the bundle-like or sheaf-like structure that the crystals might have been expected to exhibit.

The explanation of this phenomenon put forward by the Bureau's Dielectric's Section involves nucleation and growth theory. They have demonstrated that in sufficiently dilute solution, the rate of formation of the seeds leading to folded crystals must exceed that of seeds lead-

ing to the bundle-like type.

In considering the growth of each folded nucleus, it was shown that the thickness (often called the step height, l) will not increase rapidly as the platelet becomes larger in the x - and y -directions, thus preserving the thin plate-like character of the crystal. This tendency for the step height to maintain itself during the growth process is a result of the fact that a crystal of step height l grows much faster than one that is either substantially thinner or thicker. The quantity l ranges from roughly 100 to 500 Å, and increases with temperature of crystallisation.

The theoretical study has recently been extended to the case of crystallisation in bulk polymers. Results obtained strongly suggest that substantially chain-folded crystals exist in bulk polymers, especially in the spherulites. Calculations have recently been made in the Bureau which give information on the smoothness of the chain-folded surfaces and on the details of the melting behaviour to be expected for chain-folded crystals.

Refractory Concrete Withstands 3,000° in U.S. Rocket Pad Tests

REFRACTORY concrete made with Cement Fondu and heat-resisting aggregate proved to be the only material capable of standing up to the exhaust blast of space rockets—gases heated to thousands of degrees Fahrenheit striking down at supersonic velocity—in tests carried out at the Rocketdyne Division of North American Aviation Inc. In this series of tests, concrete blocks were exposed to blasts from Thor rocket engine exhausts at a 45° impingement angle. At a distance of 90 ft. from the nozzle, the stagnant temperature was as much as 3,000°F, and jet velocity exceeded 3,000 ft./sec. Ordinary concrete spalled under these conditions to a depth of 9 ft. Steel plates survived only two firings—a total of some 120 sec.—while firebrick broke up after 60 seconds.

In the course of more than 6,000 seconds of testing over a period of four months, the pad of refractory concrete was found to have spalled to a maximum of 1½ in. in two spots only.

The tests were carried out in collaboration with the Designed Concrete Co., of Los Angeles, at the Rocketdyne Division's Propulsion Field Laboratory in the Santa Susana Mountains, California.

Capper Works Rebuilt

An extensive re-organisation of production facilities, at a cost of about £80,000, has been completed by William H. Capper and Co. Ltd., who for the past 16 years have operated two works at Warrington, engaged in fabrication of pipe and specials, manufacturing of heat exchangers, coils and condensers. Expansion led to the decision to dispose of the smaller of the two works and Woolston works nearby, where there was transfer all plant and equipment to ample room for expansion.

The entire rebuilding programme was completed in the six months period ended March 1961. The new shops occupy an area of 85,000 sq. ft. and provide an increase of 40% over the combined capacity of the two original works.

Work Study President



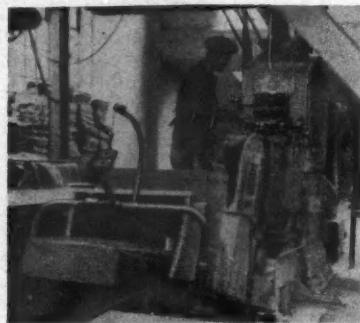
Mr. R. M. Currie (right), head of I.C.I. Central Work Study Department, was invested with the badge of office of president of the Institute of Work Study by Earl Mountbatten at the Guildhall, London, recently

Photocell Device Keeps Check on Fertiliser Bagging at Fisons' Barking Factory

AN electronic photocell batch counting device, used in conjunction with a multi-wall paper sack filling machine, is used at the Barking, Essex, factory of Fisons Ltd. to tally the number of sacks filled with fertiliser per shift, the load per lorry and the number of burst sacks. No checkers or tally men are needed, everything being controlled from the filling machine. Here there are just two men—one to operate the two-head filling machine and one to keep him supplied with sacks, take off 'bursts' and switch the chute guide as each lorry load is completed, there being two lorry stations at the loading bank.

The 1 cwt. sacks are of the valve closure type and are filled at the rate of 600/hr, giving a tonnage of 30/hr. The filling machine operator places a sack on the head, operates the hopper valve and allows the sack to be automatically filled with exactly 1 cwt. There is a vibrator foot on which the sack rests which causes the fertiliser to be shaken down during the filling cycle thus allowing an even filling of the sack which is then allowed to drop on to a conveyor while the operator is working on the next sack.

The conveyor then takes the sack through the 'counting tunnel' in which are situated the electronic photocell and light heads. The sack, passing through, breaks the light beam and causes the



Electronic batch counter in action at the Fisons factory

count to be registered. The sack now passes to the chute which takes it to the ground floor and thence to the lorry at the loading bank. Display counters are remotely fitted and the first display counter registers the lorry load total and completion of this total is the signal for the second operator to switch the chute guide so that the second waiting lorry can commence loading, the second display counter registers the aggregate for the shift.

The electronic equipment was supplied by Electronic Machine Co. Ltd., Mayday Road, Thornton Heath, Surrey.

D.S.I.R. Report Shows Concern at Rising Costs of Research

CONCERN at the rising cost of research is expressed in the annual report of the Department of Scientific and Industrial Research, 'Research for Industry 1960,' available from H.M. Stationery Office at 8s. The problem of rising costs is effecting all research associations but it is particularly critical in relation to the associations serving small industries. The Industrial Grants Committee points out that a research association's income should be adequate to meet the technical needs of the industry concerned and to offer an attractive prospect to new young research workers.

The report suggests that one way of meeting the problem is practical co-operation between research organisations such as the housing of a small research council in the laboratories of a much larger organisation, and the placing of contracts with associations with much better facilities.

The Grants Committee warns that the D.S.I.R. must be satisfied that co-operative research schemes are technically and economically sound before

offers of grants are made.

The Rubber and Plastics Research Association of Great Britain has been working on the elucidation of the reactions involved in vulcanisation by the use of peroxides. Work on the reactivity of peroxide radicals towards model rubber compounds and polyolefins using ultra-violet and infra-red spectroscopy has provided a likely explanation why cross-linking agents such as dicumyl peroxide degrade butyl rubber while cross-linking natural rubber and polythene. A second principle study is concerned with the ageing of rubbers. Degradation reactions in various polymers are being followed by stress relaxation measurements, and it is hoped that this procedure can be developed into a standard ageing test for rubbers.

The Research Association of British Paint, Colour and Varnish Manufacturers in their continuing studies on new materials have included work on organometallic polymers. Attempts have also been made to produce graft copolymers giving lacquers of high solids content but low viscosity.

Ammonium Sulphamate as Tree Killer

APPLICATION of chemicals to forest-clearing operations is envisaged in an experiment that is being conducted by the Forestry Commission in conjunction with Albright and Wilson. The Forestry Commission has been seeking a quick, inexpensive method of destroying unwanted trees and has embarked on trials, in a wood some three or four miles north of Lancaster, using ammonium sulphamate (a new plant for ammonium sulphamate manufacture is under construction by Albright's subsidiary, Marchon Products Ltd., at Whitehaven).

The technique used is to 'frill girdle' the tree with an axe and pack ammonium sulphamate crystals into the cut. The theory is that the crystals will dissolve and will be carried down to kill the roots.

First part of the experiment has been completed and results are awaited.

Transport of I.C.I. Nylon

Transport of nylon polymer made at the Billingham and Wilton works of I.C.I. Dyestuffs Division has now been taken over completely by the Wilton transport department. The changeover will involve the department in an extra million miles a year. Transport to the factories of British Nylon Spinners Ltd. will be by a fleet of 10 vehicles with a laden weight of 24 tons each.

£500,000 to Revive Shale Oil?

Latest suggestion for reviving the fortunes of the declining shale oil industry in Scotland is that made by Prof. George Hibberd, new president of the Mining Institute of Scotland, on his acceptance of office in Glasgow. He pointed out that the oil industry paid taxation of the order of £1 million/day and that diversion of only one half a day's taxes could materially aid the shale oil industry. He did not think it illogical to request that this consideration be given for the working of a valuable indigenous material.

Four Generations at Berk's



W. R. Bourne, Jr. (right) is the fourth generation of the Bourne family to work at the Abbey Mills, Stratford E.15, works of F. W. Berk and Co. Ltd., his father, W. Bourne, D.S.M. (centre) being a works driver while his uncle, F. J. Bourne (left) who has been with the company since 1917, is a loading gang charge hand. His grandfather and great-grandfather also worked there

Government Chemist Laboratory Deals with Increasing Volume of Work for Protection of Wild Life

INVESTIGATION of methods for the determination of traces of pesticide residues in crops and other foodstuffs is part of the work carried out by the Government Chemist ('Report of the Government Chemist 1960', published by the Department of Scientific and Industrial Research and available from H.M. Stationery Office at 5s). Typical of the work carried out was a study of a chromatography method and an infra-red method for the analysis of MCPA. Results were in good agreement and there seems little to choose between the two methods providing an infra-red lamp is easily available.

The panel on the evaluation of wetting agents for use with pesticides tested and approved a modification of Draves test. Modifications of existing methods for the determination of mercury in the presence of chlorinated organic compounds have been applied to formulations containing captans and heptachlor.

At the request of the Ministry of Agriculture, Fisheries and Food, the Laboratory has continued to provide a member for the Europe O.E.E.C.'s Group of experts charged with the establishment of standard methods of fertiliser analysis. Further meetings of the group were attended in Paris in April and July and have resulted in the provisional agreement of methods of analysis and sampling. These methods are not identical with the methods prescribed by the Regulations to the Fertilisers and Feeding Stuffs Acts, but both sets of methods are believed to be capable of giving true and accurate results in their proper applications.

There is considerable interest in the determination of various forms of nitrogen occurring in fertilisers and, in response to the O.E.E.C. expert group, the Laboratory developed an improved 2,4-xylenol spectrophotometric method for the determination of nitrate nitrogen.

Among the more long-term work in this field being carried out by the Laboratory of the Government Chemist is methods of analysis of chlorinated hydrocarbons, fluoroacetimide and fluoroacetic acid, organomercury fungicides and organophosphorus insecticides. This work is done mainly for the Scientific Sub-Committee of the Interdepartmental Advisory Committee on Poisonous Substances used in Agriculture and Food Storage. Pesticide work of the Sub-Committee includes determination of residues to assist in framing recommendations. The extension of this work to settle questions relating to dangers of wild life has caused such interference to the investigatory work that arrangements have been made to establish a new sub-division to undertake this branch of the work.

Also part of the long-term work of the laboratory is the investigation of simple tests, easily applied under factory conditions, for the determination of toxic substances in industrial atmospheres. The progress of investigations achieved in 1960 included a simple field test for the determination of about 1 p.p.m. of nitrobenzene vapour in the atmosphere and a method capable of determining below 0.05 p.p.m. of arsine.

In recent years considerable interest has been shown in the detection of toxic gases by means of indicator tubes. These contain solid absorbents, such as silica gel, which are impregnated with a chemical reagent capable of reacting with the toxic substance to produce a coloured compound. Preliminary investigations have been made on the technique of preparing indicator tubes for some aromatic hydrocarbons and this work will be extended to cover the efficiency and stability on storage of these detecting systems in appropriate cases.

Work for the Customs and Excise continues to be one of the major activities of the Laboratory. This includes the examination of selected samples of import goods liable to protective duties under the Import Duties Act 1958, such as cereals, plastics, chemicals, textiles and metals.

South-East Asia Offers Promising Markets to U.K. Firms

SOUTH-EAST Asia presents a promising but difficult market to British firms; some are succeeding brilliantly but others are failing to meet the challenge of new conditions. This is the conclusion of the British Trade Delegation, sponsored by the Board of Trade and the Federation of British Industries, which visited the area as four separate missions in April this year. The missions were to Indonesia; the Philippines, North Borneo and Sarawak; Singapore and Malaya; and Thailand and Burma. Their reports are published by the Federation of British Industries, 21 Tothill Street, London S.W.1.

Thailand. Large quantities of fertilisers have already been supplied at half price under I.C.A. aid and the best prospects for increased use are among maize, kenaf, sesamum and vegetable growers. The Thailand Ministry of Agriculture is running a demonstration programme to encourage rice fertilisation. The Ministry is also working out the question of farm credit which could cover fertilisers.

Burma. It seems worthwhile for the U.K. to consider all possible means of helping Burma increase her fertiliser use. Imports in 1959 were approximately only 12,000 tons and that mostly ammonium sulphate. The mission believes that the case for helping them by short term loans may warrant examination.

Of industrial chemicals, only sulphuric acid is as yet being made in Burma. There is a fair market for the commoner inorganic chemicals, explosives, thermoplastics materials and dyestuffs. The U.K. range of organic chemicals are as yet too far advanced for the market, but opportunities will appear from time to time.

Pan-Malaya. An increase in the tonnage of chemicals for water treatment will be required in this area when rural and urban supplies are increased. A paper industry when created will also require large tonnages of chemicals.

The Philippines. The growth of the industries using plastics raw materials, and the establishment eventually of further units to produce plastics raw materials and resins locally, will provide increasing outlets for plant and machinery. The planned expansion of the local chemical industry will also require considerable purchases of plant. Information on planned projects is available from the Commercial Department of the British Embassy and Philippine official sources.

The market for plastics raw materials is still small but expanding. Estimates of present consumption are: p.v.c. 2,500 t.p.a.; polystyrene 1,200; and polythene 1,500. Total local capacity of p.v.c. at the end of 1962 will be 6,000 tons, but no known plans exist for the production of polystyrene or polythene.

Despite local production of chemicals both actual and planned, many basic products will continue to be imported for some years.

Indonesia. Indonesia is anxious to develop its petrochemical industry and, in the first place to produce plastics which may be used by small industries for the manufacture of domestic articles and similar goods.

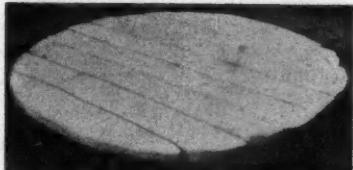
Course on Corrosion Engineering

A course of 15 lectures on elementary theory of corrosion and the range of conventional anti-corrosion techniques will be held at Brooklands Technical College, Weybridge, from October until May. The course will cover material substitution and water treatment, insulating coatings, cathodic protection, sacrificial coatings, practical techniques, paint formulation, plastics, buried substances, submerged structures, structures in the atmosphere and the economics of anti-corrosion techniques. Fee is 30s per student; further details are available from Mr. A. C. Mackinlay, head of the Engineering Department.

EASILY RE-CALIBRATED THERMOMETER

CLAIMED to be the first British bi-metal thermometer specially designed so that it can be re-calibrated without calling in a skilled technician, is the Zero Re-Set produced by the British Rototherm Co. Ltd., Merton Abbey, London S.W.19. At the lower back of the vertical head of the thermometer is a countersunk instrument screw and, after removing this, two turns of a 2 BA Allen key will loosen the locking screw and allow the thermometer stem to be rotated. This rotation moves the pointer and allows adjustments of up to 50% of the scale range. A stop is incorporated in the locking device which makes it impossible to damage the instrument.

The thermometer is at present available with 2½ in., 4 in. and 7 in. dials in the vertical pattern in all standard temperature ranges. Horizontal patterns of this thermometer will be available shortly.

POLYPROPYLENE DEMISTER

This 9 ft. dia. KnitMesh demister is in polypropylene, being made in slabs of 12 in. and can be inserted inside existing vessels. Advantages of polypropylene demisters include excellent corrosion resistance, light weight, and low cost compared with a similar product in Monel or stainless steel, according to the makers, KnitMesh Ltd., 36 Victoria Street, London S.W.1

CARBOY TILT-FRAME SAVES WASTE

DESIGNED to eliminate waste when dispensing liquids from carboys, the Powerhead carboy holder consists of a nylon-coated steel frame, triangular in shape, which takes up only 18 sq. in. of floor space. This frame stands 2 ft. 6 in. high and has pivoted at the apex a U-shaped cradle on which the carboy rests. One arm of the cradle is extended beyond the pivot and this forms a handle which makes it easy to tip the carboy gently and accurately. The whole frame for a 5-gall. carboy weighs only about 16 lb. Holding frames for 10-gall. carboys are also available.

Manufacturers are Powerhead Ltd., Nelson's Row, Clapham, London S.W.4, who invite enquiries and requests for individual specifications.

SENSITIVE HYGROMETER ALARM

ULTRA sensitive indicator alarm for moisture in gas or air, now introduced, has a dial scaled -120 to -20°C dewpoint or in percentage relative humidity as desired. The hygrometer alarm contains a transistorised relay which operates alarm

claims to be the first British bi-metal thermometer specially designed so that it

can be re-calibrated without calling in a skilled technician, is the Zero Re-Set produced by the British Rototherm Co. Ltd., Merton Abbey, London S.W.19. At the lower back of the vertical head of the thermometer is a countersunk instrument screw and, after removing this, two turns of a 2 BA Allen key will loosen the locking screw and allow the thermometer stem to be rotated. This rotation moves the pointer and allows adjustments of up to 50% of the scale range. A stop is incorporated in the locking device which makes it impossible to damage the instrument.

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EQUIPMENT NEWS**Chemical Plant : Laboratory Equipment : Control and Indicating Instruments**

or control contacts according to the setting of the lower red dial pointer, which is adjusted by the thumb screw under the dial. The instrument works equally well when immersed in liquids containing a slight amount of water. Full-scale indication on the dial is obtained when the element is immersed in paraffin containing 50 p.p.m. of water.

The sensing element can be several hundred yards away from the instrument, only a simple connection to the mains supply is needed, and no maintenance whatever is required, the maximum temperature rating being 180°C.

The makers, Shaw Moisture Meters Ltd., 31 Market Street, Bradford, Yorks, state that delivery is from stock and the price is £200 complete with sensing element.

AEROSOL CODING DEVICE

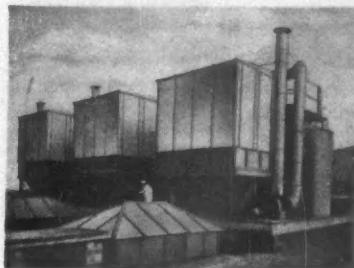
CODING device for attaching to any conveyor line handling aerosols or cans or any basically cylindrical container is offered by Mark-O-Print Ltd., Station Path, Putney Bridge Station, Fulham, London S.W.6. The Sideline Markocoder is very easy to install, requiring only four screws to attach it to a conveyor. It is driven by the product stream and operates at any line rate up to 150 units/minute. It can imprint code dates, lot numbers, prices, or other information in letters or figures of both, on flush, recessed, flat, or concaved bottom surfaces.

The makers point out that as the device is driven by the stream of products through it and has no electrical components, it is ideally suited to factory areas where there is some risk of explosion or where there is a lot of moisture. Quick drying inks are available for metal, plastics and other non absorbent surfaces or for paper board.

DUST PROBLEM OVERCOME

DUST problems encountered in the manufacture of Ajax cleaning powder at the Trafford Park, Manchester, factory of Colgate-Palmolive Ltd. involved dust clouds emanating from chute to mixer delivery, pressure relief on the mixer itself and from four points on a Nalbach filling machine. Continuous operation of the dust plant was necessary, calling for a separating medium which would ensure constant air flow, thereby maintaining adequate suction at all points.

Three identical Dallow Lambert Dry-tube fabric filter plants were installed, each handling 2,700 cu. ft./min. of air. Each filter has 1,000 sq. ft. of nylon filter bag area with automatic shaking gear enabling the sleeves to be cleaned while the fan is in operation. Each fan,

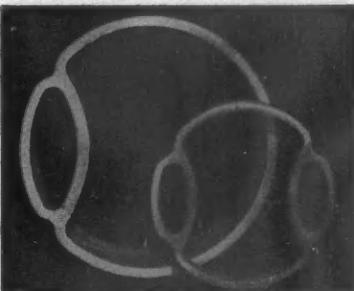


Dallow Lambert filter plants at the Colgate-Palmolive factory

which is on the clean air side of the filter, is powered by a 7½ h.p. motor and the whole of the equipment, of weather-proof design, is mounted on the flat roof of the building enabling the collected dust to be fed back by gravity into the product handling system by means of discharge ducts from the filter hoppers. Filter plants were supplied by Dallow Lambert and Co. Ltd., Thurmaston, Leicester.

DUAL-CHANNEL ALUMINIUM TUBE

DESIGNED for use in the processing of chemical and food products, where liquids must be kept warm to prevent solidifying when being pumped from one location to another, Unitrace extruded aluminium alloy tube is claimed to be equally effective where liquids have to be kept cool at a controlled temperature. The tube combines two integral channels, the larger for the product line,



Sections of Unitrace and Duotrace aluminium alloy tube

the smaller for the tracer line carrying the heating or cooling medium. The range has now been increased by the addition of Duotrace, with two tracer lines instead of one.

Unitrace is available in standard 30 ft. lengths and in seven standard sizes from 1 in. to 8 in. Outside diameter of the tube conforms to standard pipe sizes so

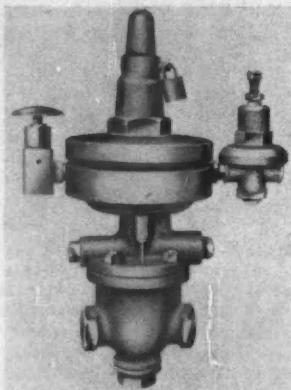
that normal insulation can be fitted. Special flange fittings make it possible to bolt lengths of Unitrace together by standard flanges or to jacketed fittings by means of adaptor flanges.

The tube is marketed in the U.K. by the I.C.I. subsidiary, Imperial Aluminium Co. Ltd., Kynoch Works, Birmingham 6.

QUICK FILLING ATTACHMENT

QUICK filling attachment offered by Sir W. H. Bailey and Co. Ltd., Albion Works, Patricroft, Manchester, is described as an advanced type of pressure regulator that gives improved performance when controlling steam supply to closed vessels. It is claimed that this device decreases vessel filling time, improves efficiency and cuts costs.

Full flow through the reducing valve is maintained until the set pressure is very nearly attained by delaying the regulating action of the reduced pressure. At about 2 p.s.i. below the required pressure the diaphragm control valve lifts to admit steam to the underside of



Steam supply control device

the diaphragm of the reducing valve, which then assumes control in the usual way. Conversely, an increase in flow and a corresponding drop in reduced pressure cause the diaphragm control valve to close and the reducing valve to open wide. In actual operation, very sensitive control is achieved by adjusting the needle valve.

HOPPER LEVEL SWITCH

Engineering Co. Ltd., Ruislip, Middlesex, is particularly suitable for light powders and products of low bulk density.

It comprises an aluminium alloy body measuring 5 in. dia., and 2½ in. deep, with a separate fixing clamp and two compartments separated by a stout partition. This serves the dual purpose of protecting the diaphragm against overloading, and of preventing the contents of the hopper entering the electrical compartment in the event of diaphragm failure.

The replaceable steel or plastic sheet

AN automatic hopper level control switch for solids and slurries, introduced by Mucon

CHEMICAL AGE

CHEMICALS ON TAP

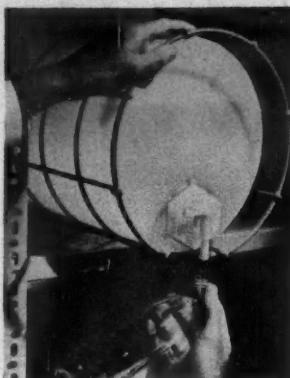


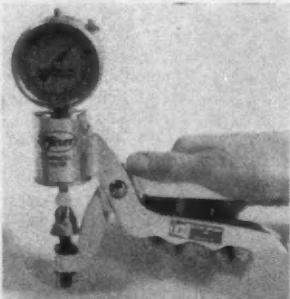
Photo shows how the range of uses of the Polycrate—a polythene carboy in a wire crate—has been extended to include drawing off small quantities of liquid from a horizontal racked position. This has been made possible by the introduction of a polythene screw cap with a built-in tap, and a flush-fitting vent hole plug. Makers are the Bowater Organisation, Bowater House, Knightsbridge, London S.W.1

diaphragm can be supplied with various coverings when necessary. Sensitivity can be externally adjusted, and deflection of the diaphragm is directly transmitted to a micro-switch. Plug or conduit entry can be provided, and the switch may be connected for local indication, remote signal, motor control switching, bin stock control, etc.

TABLET HARDNESS TESTER

DEVELOPED by Chas. Pfizer and Co. Inc., a hardness tester is now being offered to general industry by a U.S. equipment company for testing and controlling the hardness of caked or compressed industrial chemicals, pharmaceutical tablets, fertiliser pellets, animal food pellets, and many other industrial products.

As shown in the accompanying photograph, the Pfizer tester is shaped somewhat like a pliers with a dial gauge. As the sample is squeezed between two anvils the maximum pressure in pounds and kilogrammes is recorded on the dial. Most tests take less than 5 sec. A stopwatch type indicator remains at the



Testing a pellet for hardness

15 July 1961

breaking reading until reset. Standard testing capacity is 35 lb., but higher ranges can be provided to order by the makers, Testing Machines Inc., 72 Jericho Turnpike Mineola, New York, U.S.

SAFE AND SIMPLE SIPHON

MADE of polythene and consisting simply of a tube with a tap at one end and a concertina-like bellows pump towards the other, the Dohm-Vorax siphon is claimed as a safe and economical method of transferring liquids from one vessel to another.

In use, the tap is turned to the closed position, the bellows are compressed and the open end is inserted in the vessel from which the liquid is to be taken. The bellows pump is released and liquid is drawn into the tube. By opening the tap, the liquid is allowed to flow freely through by siphon-action, with the flow always readily under control at the tap.

Two models are available, model AA, bellows capacity ½ pint, price 35s, and model A AG, bellows capacity 3 pints, price 67s, from Dohm Ltd., 167 Victoria Street, London S.W.1.

RADIOACTIVE CONTAMINATION CHECK

TO avoid expensive tooling costs when developing a new atomic safety instrument, E.M.I. Electronics Ltd. of Hayes, Middlesex, decided to have the housing made from polyester resin reinforced with glass fibre. When final modifications had been made, the engineers were so satisfied with the material that they decided to use it for production models as well.

The instrument is the new E.M.I. Single Hand Monitor, which measures radioactivity and is designed to provide a quick efficient means of checking contamination of the hands of laboratory staff working with radioactive materials such as isotopes. Intended for use in small laboratories in hospitals and universities, it



Radioactivity monitor

gives audible and visible alarms if the contamination exceeds the British Standard safety level.

The radioactivity monitor housings—incorporating a panel which can be removed for inspection and adjustment—are moulded by John Colinsons Ltd., Slough, using Cellobond polyester resin manufactured by British Resin Products Ltd.

Overseas News

U.S.S.R. CATALYTIC PRODUCTION OF HYDROGEN PEROXIDE FROM ELEMENTS

As part of a systematic study on the catalytic synthesis of hydrogen peroxide from the elements themselves, Russian chemists have been carrying on a number of investigations. In one study, an attempt was made to find optimum conditions of the catalytic reaction on palladium using oxyhydrogen gas as raw material.

A new study, just reported, deals with the mechanism of catalysts by comparing the action of two different catalysts—palladium and platinum. It was found that on the Pd catalyst, H_2O_2 is formed in the first stage; on Pt, H_2O is the predominant yield. The experimental data and the computation of the kinetics of the process indicated that the Pd catalyst has active centres consisting of two Pd atoms while the Pt active centres are formed by single atoms. Differences in catalytic action are attributed to differences in adsorption and splitting of H—H and O=O molecules on the active centres. Doublets of Pd₂ adsorb H₂ in the first stage, completely separating both H atoms; the O₂ molecule is adsorbed at the junction of the doublet with rupturing of only one of the two molecular bonds. The -O-O-group essential for the formation of H-O-O-H is then obtained.

In the case of platinum, however, oxygen is adsorbed first, with complete separation of both atoms and resultant formation of H-O-H. The possibility of diluting the Pd catalyst with an inert carrier is noted as having potential industrial importance.

Butadiene Project in Brazil

The Brazilian oil company and petrochemical producer Petrobras has announced the signing of a contract with Houdry Process Corporation, of Philadelphia, under which it will take up the licensed production of butadiene. The plan to produce its own butadiene will save Brazil an estimated \$ (U.S.) 7.5 million worth of foreign currency annually. It connects up with a styrene-butadiene rubber project, due to start this year, in which some 29,000 annual tonnes of synthetic rubber will be produced.

W. German Expansion in Phenol, Phthalic and Maleic

A number of plant expansion projects in the field of West German coal chemicals has been announced from Essen by the carbon chemical organisation Fachverband Kohlechemie e.V., Phenolchemie GmbH, Gladbeck in Westfalen, who have just raised their phenol production to 60,000 annual tonnes and who are to increase this further to 80,000 or 90,000 tonnes per year.

Harpener Bergbau AG, at present operating a maleic anhydride plant on an experimental basis at their Amalia cokery, are planning to build a phthalic anhydride unit. Rheinpreussen AG für Bergbau und Chemie, of Homberg/Niederrhein, are in the process of extending their 4,500 t.p.a. phthalic anhydride plant and have started on construction of one for the production of maleic anhydride. Ruhröl Chemiewerk der Steinkohlenbergwerke Mathias Stinnes AG, of Bottrop, are raising their maleic anhydride capacity to 4,500 tonnes annually, capacity of its new fumaric acid unit to be brought up from the present level of 2,400 t.p.a. to an eventual 3,000 annual tonnes.

Potassium Fertiliser Plants in Poland

A hydrochloric acid plant and a potash flotation unit at the new potassium salts combine at Kłodawa, Poland, are due to start production in the first quarter of next year. Production of potassium chloride synthetic fertiliser at the combine will also begin during the course of next year. By the target year of 1965 the combine plans to have built up an annual capacity of 25,000 tonnes of potassium fertilisers.

Canadian Chemical Production Up in First Quarter

Production of most chemicals in Canada was greater in the January-March period this year than in the first quarter of 1960, according to the Bureau of Statistics. Output in the first quarter included: hydrochloric acid, 13,696,187 lb. (10,967,590 a year ago); sulphuric acid, 424,708 tons (478,307); ammonium sulphate, 75,351 tons (80,154); chlorine, 83,383 tons (77,738); mixed fertilisers, 285,546 tons (286,052); formaldehyde, 15,456,814 lb. (14,624,075); and sodium hydroxide (caustic soda), 97,937 tons (92,300). Shipments of polystyrene for the quarter totalled 14,310,752 lb. versus 13,787,461.

Lenzing of Austria to Make Polyester and Acrylic Fibres

Zellwolle Lenzing AG, rayon producers, Austria, are to invest some Sch.200 million in a new firm to be formed jointly with Goodyear of the U.S. for the production of polyester fibre. The Austro-American venture will start production in about two years' time. A similar investment is to be made in an all-Austrian joint project by Lenzing and the State-owned Stickstoffwerke concern, of Linz, for the production of acrylic fibre. Further development by Lenzing, who have recently cut rayon output and

dismissed a number of workers, concerns continuous production of Austrophan cellulose films and the planned production of a special compound fibre. New to the company's programme is a viscose fibre type, said to be 20% better in properties than other fibres of the same price and basic materials.

New Process Patented for Producing Sulphur

A new process for the production of sulphur has been granted U.S. Patent No. 2,987,379, assigned to Universal Oil Products Co., Des Plaines, Ill.

In producing sulphur, sulphur dioxide and hydrogen sulphide are absorbed in an organic solvent and water. The sulphur dioxide and hydrogen sulphide are reacted in contact with the solvent and water thereby forming sulphur. The improvement in the process covered by the patent comprises adding to the solvent an amine selected from the group consisting of N,N-dimethylaniline, N,N-diethylaniline, N,N-dipropylaniline, dimethylamine, trimethylamine, diethylamine, triethylamine, dipropylamine, tripropylamine, dibutylamine, tributylamine, dipentylamine, tripentylamine, dimethanolamine, trimethanolamine, diethanolamine, and triethanolamine. As a result of the addition, sulphur is formed in a granular and more readily recoverable state.

Petrochemical Plant for Naples

Compagnia Tecnica Industrie Petroli (CTIP) of Rome, has been entrusted with the task of constructing a petrochemical plant in Naples for Mobil Chimica Italiana (an affiliate of Socony Mobil Oil). The new plant, whose initial capacity has been scheduled at 150,000 tonnes a year, will process products from the nearby Mobil Oil Refinery to produce orthoxylol, paraxylol, benzol, and ethylbenzol. The plant is to go on stream early in 1963.

Vinyl Chloride Production in North Korea

A vinyl chloride plant, the country's first, is now in operation in North Korea, according to East German sources. The unit has an annual capacity of some 6,000 tonnes.

German Chemical Exports Show Smaller Increase

Over the first quarter of 1961 West German chemical exports rose by only 6% over the corresponding 1960 period to DM1,600 million, the German Society of Chemical Industry announces from Frankfurt-on-Main. Rate of increase for the first 1960 quarter over the corresponding 1959 period had been of 24%. The increase rate dropped to only 3% by this March and current reports indicate that exports are stagnating further, this being attributed by the Society to the revaluation of the Mark.

West German chemical exports to fellow-members of the Common Market have remained stable at 25.8% of the

total, those to E.F.T.A. countries having fallen over the year from 28.5% to 27.2%. Main customer remains Holland. Imports by West Germany of chemical products were only a negligible amount above the 1960 first-quarter figure at DM639 million (637 million), in the face of a sensational rise of 50% over the corresponding 1959/60 quarter. Imports from the E.F.T.A. bloc fell to 22.4% of the total, while those from other Common Market members went up steeply from 28.7% to nearly 33% of the total. Main supplier is France.

New Plans for Nitrate in Chile

The Chilean Government is considering the installation of a new plant for nitrate production near Iquique. This was revealed by the Minister of Mines in a statement in which he denied a rumour that the Victoria nitrate plant of the Compañía Salitrera de Tarapacá y Antofagasta was to be closed. On the contrary, the Minister said, production at the plant (which is now operated by a government-appointed committee) would be increased from 9,000 to 20,000 tons/month. He added that present production methods at the nitrate plants were in need of reform, hence the consideration being given to the Iquique project.

New Process for Atlas Powder Glycerine and Glycols Plant

M. W. Kellogg Co. New York, are to be constructors of a new plant for Atlas Powder Co., Wilmington, Delaware, to produce 25,000 short tons/year of glycerine and allied polyalcohols from a molasses base. Production, by a special Atlas Powder process, will start next summer. The process is said to be "in a completely new direction" and permits the processing of molasses and other carbohydrates into glycerine, ethylene glycol and other glycols. An auxiliary hydrogen plant required for the new production unit will be built by Chemical Construction Co., also of the United States.

More Chlormethyl From Hungary

A new production unit has been brought into operation at the Egyesüvek (United Chemical Works) plant in Hungary by which the company's chlormethyl production will be doubled.

India's Plans for Chemical Industry Expansion

Organic chemical production in India which last year reached 11 million lb. is to be increased to 80 million lb. with a total worth of Rs500 million over the coming five-year period. Hitherto all intermediate products have had to be imported by India; contracts have now been signed with foreign concerns for the construction of plant producing these.

The intermediates plant to be built by a West German consortium in the State of Maharashtra alone will have an annual capacity of 25,000 tons and save Rs50

million in foreign currency per year for India. Production worth of the Indian pharmaceutical industry, which rose over the past 12 years from Rs100 million to Rs700 million, is to be quadrupled over the next five years, the Soviet Union giving aid in the building of four new plants alone. Sulphuric acid output, only 164,000 tons a year in 1955/56, and now at some 400,000 annual tons, is to be raised to 1,500,000 tons/year under the third five-year plan. Caustic soda annual output is to increase from 125,000 tons to 400,000 tons and that of calcined soda from 200,000 tons to 450,000 tons.

Acetylene, Ammonia, Methanol and Vinyl Plants for Tenneco

Tenneco Chemical Co., a subsidiary of Tennessee Gas Transmission Co., are to build a large-scale petrochemical combine at Houston, Tex. The plant will include an acetylene plant producing some 100 million lb./year by a process of Société Belge de l'Azote et des Produits Chimiques du Marly (S.B.A.), Liège, Belgium, and to be constructed by M. W. Kellogg Co., New York. Further plants will be for the production of vinyl chloride monomers, vinyl acetate monomers, ammonia and methanol. Capacity of the vinyl chloride plant is given as 200 million lb./year, but production of the three other units has not yet been made known. Ancillary plants outside the main works area will be constructed by the Bechtel Corporation.

Chemico Urea Plant Project in Japan

Following news that Ube Industries of Japan are applying for permission to use the Fauser-Montecatini urea process, Japan Gas-Chemical Co. have sought approval for a licence to build a 90 tonnes/day Chemico urea plant. Gas-Chemical are producing 180 tonnes/day and now wish to raise this to 270 tonnes/day by 1962.

More Carbon Black for Degussa

This September the Frankfurt-on-Main chemical producers, Deutsche Gold- und Silberscheideanstalt AG, will take up production at their Kalscheuren works of HAF and ISAF carbon blacks,

at a combined annual capacity of 12,000 tonnes. This capacity will be doubled by the end of next year. This announcement follows the start last month of production of the two types by the 50% Degussa subsidiary KG Deutsche Gasrusswerke GmbH and Co., Dortmund, at a combined production equal eventually to 25,000 t.p.a.

Increased Nylon 66 Capacity for Chemstrand

An increase of 200% to 40 million lb. per year of nylon 66 fibre is planned by Chemstrand at their Greenland, S.C. plant. The expansion is scheduled for completion in May 1962. The raw material for the plant will come from the nylon 66 Chemstrand unit at Pensacola, Fla., which has a capacity of 114 million lb. per year.

New Swedish Process for Trinitromethane

Details of a new Swedish process for the production of trinitromethane (nitroform), a basic building block for explosives and propellants, were revealed at the Purdue symposium on nitro-aliphatic chemistry. The process is a conventional nitration of acetylene but with a special two-stage distillation. The overall yield averages 74% and loss of nitric acid is about 2% in a 60 ton-a-year plant of Nitroglycerin AB now operating in Sweden.

American Cyanamid Plan Ammonia Expansion

A \$3 million expansion of their anhydrous ammonia plant at Fortier, La., is planned by American Cyanamid. This expansion will increase the capacity by 40%. Construction is to begin shortly and is expected to be completed by 1962.

Michelin Synthetic Rubber Plant for Bordeaux

Plans to build a synthetic rubber plant near Bordeaux, involving an investment of NF.60 million, have been announced by the Michelin concern in Paris. Type of rubber to be produced and the planned capacity are not revealed. The plant is expected to be in operation in 1963.

Phthalic Anhydride Factory in N. Korea



View of the Hungarian-built phthalic anhydride, chlorobenzene and dyestuffs factory in North Korea, construction of which was supervised by a Hungarian woman technologist, Vera Huszti (see 'Distillates')

Bookshelf

N.B.A. Introduce Completely New Textbook on Hydrocarbons

BENZOLES, PRODUCTION AND USES. Edited by G. Claxton. National Benzole and Allied Products Association, 1961. Pp. xiv + 979. 105s.

Mr. Claxton with W. H. Hoffert wrote 'Motor Benzole, its Production and Use' in 1931, it was revised in 1938. Now Mr. Claxton has produced an entirely new book with the aid of a small publications committee and several collaborators who wrote much of the work but whose exact contribution is not specified. An immense amount of information on the hydrocarbons has been gathered together in a convenient form and offered at a low price. Anybody interested in the commercial exploitation of the chemicals will be well advised to buy a copy.

Although many of the facts recorded and methods described have only recently been reported the general treatment gives the impression of being rather old-fashioned. Sometimes too much emphasis is placed on the Benzole Association's own procedures. The section of gas chromatography does not give a balanced account of the technique though it is pleasant to see the recognition of Scott's elegant contributions. The section of twelve pages on dyestuffs is ill-advised, 1,200 pages could have been written in view of the importance of this subject. It would have been better to note the outlet for the benzole in a few lines and left it at that.

► Handbook for Chemists

HANDBOOK OF CHEMISTRY AND PHYSICS, 42nd EDITION. Edited by C. D. Hodgman. Chemical Rubber Co., Cleveland, 1960. Pp. xxvii + 3481. 105s.

This handbook, universally known as 'the bible', needs no introduction to any chemist. He will only want to know what are the new tables which will make it worth his while to acquire the latest edition. The most notable are on surface tension; dissociation constants; solutions giving round values of pH; sublimation data; and bond lengths. The drying agents section has been revised. Minor improvements have been made in many sections.

► Telomerization

TELOMERIZATION AND NEW SYNTHETIC MATERIALS. By R. K. Friedlina and S. A. Karapetyan, translated by M. F. Mullins. Pergamon Press, 1961. Pp. x + 102. 25s.

The Russian preface of this book, originally published in 1959, contains the statement that 'the whole account is written for the reader with an average school knowledge of the fundamentals of chemistry and physics.' Judged by this

objective the authors have done a creditable job spoiled only by ludicrous over-emphasis of the work of Russian scientists. Anybody who reads the book in the hope of learning at first (or at least second) hand of the notable Russian work in the field will be wasting his time. The book is no use even as a key to further reading as references are not systematically given.

The readers irritation that a translator's time should have been wasted on such slight material is not mollified by a smug notice from the publisher suggesting that he is performing a public service.

► Rocket Technology

LIQUID ROCKETS AND PROPELLANTS. Edited by L. E. Bollinger, M. Goldsmith, A. W. Lemmon. Academic Press, New York, 1960. Pp. xvi + 682. 52s.

This is the second volume of a series sponsored by the American Rocket Society. It is largely based on papers submitted to a symposium in July 1960. Rapid publication has been achieved partly by the use of photolithotyping of excellent quality; the numerous illustrations are remarkably clear. The editors justly claim that the treatment of the theory and practice of the use of exhaust diffusers to achieve high-altitude nozzle-exit conditions is the most extensive in the literature. Rocket specialists will clearly buy this volume so that it is chiefly to consider what it contains for the layman. Combustion instability is a widely occurring problem on which useful papers were given. There are also six papers on general gas kinetics. More surprisingly there is a paper on the electro forming of rocket nozzles. Electroforming is not yet a common technique; its improvement and popularisation may yet be a significant by-product of space research.

► Geological Analysis

SPECTROCHEMICAL ANALYSIS 2ND EDITION. By L. H. Ahrens and S. R. Taylor. Pergamon Press, Oxford, 1961. Pp. xxiv + 454. 105s.

The sub-title of this book, 'A treatise on the d-c arc analysis of geological and related materials', accurately describes its contents. The first edition was published in 1950. It has been modified by the extensive discussion of three major developments: the use of the technique for estimating elements in high concentrations; methods by which several elements can be estimated in one operation; and the use of enrichment techniques. In addition the literature has been covered up to December 1959 (this useful

specification of the date could well be copied by more authors) and all geological applications are recorded in the bibliography which lists the titles of all papers.

The first half of the book covers the principles and practice of analysis. The second is devoted to the spectrochemistry of individual elements. The bibliography is followed by 70 pages of wavelength tables.

This is a specialist treatise intended for workers in a well-defined field; they should find it convenient and comprehensive.

► Electrochemistry

ELECTROLYTIC DISSOCIATION. By C. B. Monk. Academic Press, London, 1961. Pp. xii + 320. 60s.

Editors of learned journals nowadays rarely allow authors to set out in full the steps by which their results are obtained from the experimental observations. Since general texts can only cover a few of the more elementary arguments and specialist monographs are apt to assume that the reader is already an expert, books such as that under review are very welcome. It sets out to provide the student at the post-graduate level with a thorough grounding in the branches of electrochemistry covered. A particularly attractive and useful feature is the number of examples which show how to treat raw data. Many students will find that this approach gives life to a subject that they may have considered dry.

The first third of the book covers conductance, interionic attraction theory, reversible cells, activity coefficients, partial molar quantities and diffusion. The remaining chapters carry the heading incomplete dissociation which has been the author's main interest for many years. All scientists concerned with electrochemistry will want to study this book in detail.

► Gaseous Properties

THERMODYNAMIC FUNCTIONS OF GASES, VOL. 3—METHANE, NITROGEN, ETHANE. Edited by F. Dini. Butterworths, London, 1961. Pp. vi + 218. 63s.

All scientists concerned with the thermodynamic properties of gases must now be familiar with this useful series. The present volume follows closely the pattern laid down by its predecessors. Generally all the good determinations of each property are listed and a recommended value suggested. Some reasons are given for the preferred value but methods of determination are not discussed in detail. Full references to the original literature are provided.

Books such as this are primarily for the specialist but all good libraries should contain them. Workers whose interests only occasionally involve them with these gases will find the tables clear and convenient. The carefully selected 'best' values are particularly useful for the non-expert.

● **Mr. A. Robinson**, formerly chairman and managing director, is now chairman of Whiffen and Sons Ltd., Loughborough (a member of the Fisons Group) under board changes taking effect from 1 July. **Mr. A. H. Pashley**, formerly director and commercial general manager, has, as stated last week, become vice chairman, while **Mr. A. P. Lowes**, formerly director and technical general manager, and **Mr. A. S. Woodhams**, formerly of Fisons Ltd., have become joint managing directors.

● **Mr. Gerald B. W. Norton**, previously associated with Dow's plastics sales for Europe, has been appointed special projects manager, European area. He was area co-ordinator for Dow International in Midland until 1959, when he was transferred to Zurich, Switzerland, where he will remain in his new assignment as special projects manager.

● Two area sales managers have been appointed by Associated Chemical Companies (Sales) Ltd. **Mr. Percy J. Williams** becomes Midlands and Southern area



J. Wells



P. J. Williams

sales manager, and **Mr. Jack Wells** is appointed Northern area sales manager. Mr. Williams will be resident in the company's offices at 6 Arlington Street, St. James's, London S.W.1, while Mr. Wells will be headquartered in the company's offices at Trafford Park Road, Manchester 17.

● **Dr. G. C. Gibbons**, chief chemist of Domestos Ltd., Newcastle upon Tyne, since 1957, has been appointed technical director of the company. Dr. Gibbons, who joined Domestos from Stephenson's Dyers Ltd., Derbyshire, was previously with the British Cotton Industry Association and Unilever. **Mr. G. Duncalf**, who succeeds him as chief chemist, recently joined the company from Goddards of Leicester.

● **Mr. A. Fraser Much**, I.C.I., has been elected to the council of the Printing, Packaging and Allied Trades Research Association.

● **Mr. F. Davies** and **Mr. P. W. Jacob** have been appointed sales managers for the North and South Regions, respectively, of the Plastics and Rubbers Division of Shell Chemical Co. Ltd. This reflects the growing importance and interest of Shell Chemical in synthetic rubbers. Both Mr. Davies and Mr. Jacob have been actively concerned with the marketing of Shell's Cariflex rubbers since their introduction to the market early in 1958. Mr. Davies will operate from the Plastics and Rubbers Division

PEOPLE in the news

regional office at Deansgate, Manchester 3, and Mr. Jacob from the South regional office at Villiers House, Strand, W.1.

● **Dr. F. H. Banfield** has resigned as director of research of the British Food Manufacturing Industries Research Association on his acceptance of a directorship with C. Shippam Ltd., of Chichester. He was appointed chemist and physicist on the staff of the British Food Manufacturers' Research Association in 1926 and was appointed director of research of B.F.M.I.R.A. early in 1951. The B.F.M.I.R.A. has set up a committee to consider the appointment of his successor.

● An honorary D.Sc. degree was conferred on **Sir Alexander Todd** at the University of Sheffield recently. Sir Alexander will be president of the Chemical Society meetings to be held in Sheffield next year.

● **Mr. F. G. Paddle**, who has been appointed an assistant director of sales of May and Baker, was formerly head of the industrial sales division.

● **Mr. C. M. Vignoles** who retired on 30 June from the post of managing director of Shell-Mex and BP has been appointed chairman of Evershed and Vignoles Ltd. in succession to **Mr. J. C. Needham** who recently retired from the board of the company.

● **Mr. B. C. Aldis** has been appointed deputy general manager of the British Plastics Federation. He joined the Federation in 1947, has latterly supervised the technical work of the Federation and is responsible for publicity. One of his main responsibilities now is to ensure that the membership of the Federation is fully representative of this rapidly expanding industry. General manager of the Federation is **Mr. C. J. G. Stanley**.

● **Mr. M. A. Fiennes**, group managing director of the Davy-Ashmore Group, has been designated chairman to succeed **Mr. D. F. Campbell**, who will retire from the board in September. **Mr. L. H. Downes** will become vice-chairman. When Davy United merged with the Power-Gas Corporation in 1960, Mr. Campbell agreed to continue as chairman of Davy-Ashmore during the transi-

sition period. **Mr. W. R. Brown**, a former chairman of Power-Gas, retired from the board before the merger in 1960 but joined the board of Davy-Ashmore to assist during the transition period. He will also retire in September but will remain a director of Ashmore, Benson, Pease and Co.

● **Dr. Robert Heap** has been appointed consultant to the Watford Chemical Co. Ltd., London, E.3. **Mr. J. S. Baxandall** has become chief chemist and **Mr. S. J. Gambrill**, works manager.

● **Mr. A. W. Percival** has been appointed chief works study engineer in charge of the works study department of Quickfit and Quartz. **Mr. J. W. Dodds** has been appointed distribution superintendent, responsible for receipt and despatch of all goods, for routing of vehicles, and for warehousing.

● **Mr. Thomas W. Charles**, manager of the financial statements section in the Du Pont Co.'s treasurer's department, has been appointed director of finance of Du Pont de Nemours International S.A., the company's Swiss subsidiary, from 1 July. He succeeds **Mr. George C. Vennum** who will return to the parent company's treasurer's department. Mr. Vennum has been director of finance since March 1960.

● **Mr. A. W. E. Muir**, supply manager for I.C.I. Wilton Works, is joining the sales control department of Heavy Organic Chemicals Division on 1 July. He will be succeeded as supply manager by **Mr. J. H. Harvey Jones**.

● **Professor Dr. John Eggert**, head of the photographic institute of the Federal Technical University of Zurich, Switzerland, has been awarded the Adolf von Bayer Medal by the Society of German Chemists for his work in the field of determination of reaction-kinetic sequences. The society presented the Emil Fischer Medal to **Professor Dr. Hans Herloff Inhoffen**, director of the organic chemistry institute of the Carolina-Wilhelmina Technical University of Brunswick, West Germany, for his work in the field of oestron, carotene and vitamin D synthesis.



J. F. Goodman,
now head of basic
research of
Thomas Hedley
(see CA last week)

● **Dr. Muriel L. Tomlinson**, University demonstrator in organic chemistry at Oxford, has been granted an award under the Royal Society and Nuffield Foundation Commonwealth Bursaries Scheme to enable her to study polydentalate compounds at Sydney University for about three months early in 1962.



The service organisation behind the 200,000 ton annual production of DCL Bisol solvents, intermediates and plasticisers is as modern and efficient as the factories producing them. Delivery from a nation-wide network of supply depots is fast and dependable, and the well equipped Technical Services Laboratories are always ready to help customers with their manufacturing problems.

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Commercial News

Davy-Ashmore

Consolidated profits of Davy-Ashmore (recently formed by the merger of Davy-United and the Power-Gas Corporation) amount to £4,082,129 for the year ended 31 March, thus topping the forecast figure of £4 million (the figure incorporates the profits of the former Power-Gas Group as from 1 April 1960). A final dividend of 17½% makes 27½% for the year, against a forecast of 25%.

It is proposed to split the existing £1 units into 5s ordinary shares and appropriate resolutions will be submitted at an extraordinary meeting to follow the annual meeting on 27 September.

Sandoz

A record turnover of Sfr. 645 million for 1960 was reported by Sandoz Ltd., Basle, Switzerland. Compared with the previous year, this represented more than an 8% increase for dyestuffs, 16% for pharmaceuticals and 15% for chemicals. However, owing to an above-average increase in costs, profits did not increase in proportion. Net profit was Sfr. 18.9 million. As well as the statutory dividend of 5% gross, it was proposed to distribute a further Sfr. 9 million in the form of a gross dividend of Sfr. 75/share.

The board had proposed an increase of Sfr. 15 million in the share capital; it is further proposed to increase the Group's assets by an issue of debentures totalling Sfr. 60 million.

Chemical Industry Fund

The West German Chemical Industry Fund states that DM27 million, or about £2,450,000, has now been raised by voluntary subscriptions from the country's chemical undertakings. Over last year alone, when subscriptions rose by 27%, a sum of about DM6 million could be distributed by the Fund, whose aim it is to further research, scientific development and studies. A further DM9 million was put directly by the undertakings at the disposal of scientific organisations and educational centres.

Colonial Sugar

Net profit for the year ended 31 March of Colonial Sugar Refining Pty., Australia, who are linked with Distillers in chemical projects, was £A2,605,734, a fall of £A276,899. Group profit was £A2,617,735. Final dividend is 4½%, making 9% (same).

Montecatini—Philipp

Montecatini have purchased 200,000 shares of the Philipp (U.S.) mining and chemicals concern, thus acquiring an interest of about 3.8% in it, representing at present about \$6 million. The amount actually involved in this transaction has not, however, been divulged.

Philipp Corporation produce non-metallic minerals used in agriculture and various industries such as petroleum,

- **Davy-Ashmore Profits Exceed £4 Million**
- **Sandoz Show Record 1960 Turnover**
- **Montecatini Buy 200,000 Philipp's Shares**
- **Rhone-Poulenc to Increase Capital**

steel, paper, dyestuffs, plastics, etc. The company also processes various metals and minerals which it purchases from other companies (including Montecatini).

The operation is a prelude to co-operation in the sector of plastics and various chemicals and it has been hinted that the U.S. company may handle some of Montecatini's sales in America.

It has also been announced that Mr. Piero Giustiniani, managing director of Montecatini, has been appointed a member of the Board of Philipp Corporation.

Norsk Hydro

The Norwegian chemical concern Norsk Hydro reports record sales totalling Kr.600 million for the year ended 30 June—a rise of Kr.40 million over the previous year. Sales of nitrogen products at 292,000 tons, accounted for 74% of the total.

Olin

Olin Mathieson, U.S., recorded for the first quarter of the current year turnover of \$159,959,000 (\$163,132,000) and net profit per share of 38 cents (64 cents).

Pechiney

The president of the French chemical concern Pechiney, Count Raoul de Vitry, has stated in Paris that the company is expecting an increase in turnover of 15% for the current year over 1960. Over the first four months of 1961 turnover was up by as much as 20% above the figure for the corresponding period last year, but this was due partly to extensions in the company's aluminium activities. Pechiney are to pay a 1960 dividend of 9½% (same) on a capital of Fr.403,100,000 (same), plus gratis shares at a rate of 1:20 which will bring capital up to Fr.423,300,000.

Rhone-Poulenc

Rhône Poulenc, the French chemical producers, have announced plans to increase their capital from 252.6 million to 421 million francs by the issue of *gratis* shares at a rate of 1:3 and the issue of new shares at a rate of 100 francs per share of 50 francs nominal value. The capital will then be raised further to 671 million francs by the issue of 5 million new shares of 50 francs nominal value. The French synthetic fibres holding company Celtelex, now a Rhône-Poulenc subsidiary, and which is currently increasing its capital from 270 million to 300 million francs, is to reduce this to 50 million francs, exchanging the remaining 250 million

francs' worth for Rhône-Poulenc shares. All Celtelex shareholders will be able to exchange six old Celtelex shares of nominally 100 francs for ten Rhône-Poulenc shares of 50 francs and one new Celtelex share of 100 francs. All new shares will be entitled to dividend as from 1 January 1961.

Ruhrgas

The Essen, West Germany, gas producers Ruhrgas AG have issued bonds for a loan of DM40 million connected with the company's expansion in the fields of refinery gas and natural gas treatment and transportation.

Socabu

The French synthetic rubber producers Société du Caoutchouc Butyl (Socabu) announce that representatives of the French chemical companies Kléber-Colombes, Ets. Kuhlmann, Rhône-Poulenc, Ugine, Pechiney and Nobel-Bozel and the French tyre company Michelin have left the board. The company is now owned 78% by Esso-Standard and 22% by Compagnie Française des Pétroles.

At the same time, Socabu announce plans to raise production of the butyl works at the mouth of the Seine from 20,000 tonnes to 25,000 tonnes of butyl rubber annually. It is further stated that raw material will come from the local refineries of Esso-Standard and Française des Pétroles. Company exports are to rise.

Texas International Sulphur

With the purchase of 1 million shares, effective control of Texas International Sulphur has passed into the hands of Virginia-Carolina Chemical. The terms of the agreement are not disclosed. Virginia-Carolina have also entered into a contract to buy sulphur from Texas International and to supply technical and management assistance over a 10-year period.

Uclaf

Usines Chimiques des Laboratoires Françaises S.A. (Uclaf), one of France's leading pharmaceutical producers, are to pay an unchanged dividend of 8% for 1960 on an increased capital of Fr.35 million (Fr.30 million). Net profit in 1960 was Fr.6,230,000 (Fr.6,780,000).

Wasag-Chemie

Wasag-Chemie AG, Essen, propose an unchanged dividend for last year of 12% on capital of DM11,160,000 (about £1 million).



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TRADE NOTES

Uses of Topane

Further information sheets on the uses of Topane, I.C.I.'s brand of ortho phenylphenol and Topane WS (sodium ortho phenylphenate) are available from the I.C.I. sales offices. They cover Topane as a non-toxic disinfectant, for preserving building materials, for preserving adhesives, and for protecting food stores.

P.V.A. Plasticisers

Technical data sheet, No. 27, on Reoplex 400 and Reoplex 470 plasticisers for p.v.a. is available from the Geigy Co. Ltd., Rhodes, Middleton, Manchester. Both plasticisers are of the polyester class with high molecular weight and large molecular size, which minimises loss by volatility and by extractants, especially non-aqueous extractants. Reoplex 400 is an established member of the Geigy range, but Reoplex 470 is a development product designed to further improve the extraction properties of Reoplex 400.

Malathion Formulations

A general leaflet on Malastan formulations of malathion is now available from S.D.C. Pesticides Ltd., Victory House, 99/101 Regent Street, London W.1.

UV Barriers

Substantial price reductions for Tinuvin P, an ultra-violet absorber of the benzotriazole type, are announced by the Geigy Co. Ltd., Rhodes, Middleton, Manchester. The new price scale is: 1 lb., 53s 9d; 14 lb., 50s 9d; 56 lb., 49s 9d; 112 lb., 48s 9d; 356 lb., 48s 0d.

Geigy also announce the introduction of Tinuvin 326, a new ultra-violet absorber or stabiliser which, like their Tinuvin P, is a substituted benzotriazole, but absorbs at a somewhat longer wavelength (about 353 millimicrons as against 340). Tinuvin 326 is claimed to be particularly useful in polyester resins as it does not form coloured complexes with metallic salts used in cold curing.

Gallium Arsenide

Sample quantities of gallium arsenide are being offered by Johnson, Matthey and Co. Ltd., 73-83 Hatton Garden, London, E.C.1. This intermetallic compound is at present available in crystalline form, either as broken ingot or cut slices. It is hoped that single crystal material will also be available shortly.

Vat Dye for Textiles

Addition of QF Caledon Printing Yellow GW Paste to their range of QF vat printing pastes is announced by the Dyestuffs Division of I.C.I. In common with its predecessors in the QF series, the new dye is claimed to show the characteristic improved tinctorial yield under difficult steaming conditions, other advantages being the non-settling, non-drying character of the paste and its high resistance to low-temperature storage. It is similar in shade and printing behaviour to the well-known Caledon Printing

Yellow GK, but unlike the GK, does not stain the unprinted portions of the fabric during the initial soaping after-treatment. It is therefore of particular interest as an illuminating colour in discharge printing styles.

Epoxide Resins

The Epophen range of epoxide resins for electrical uses is described in a booklet available from Leicester, Lovell and Co. Ltd., North Badsey, Southampton. The booklet contains a data sheet giving useful physical and other data as well as a list of suppliers of ancillary materials and equipment.

Polycell Move

Main production centre, administrative headquarters and laboratory of Polycell Products Ltd. are to be moved to a factory recently acquired from the Ardath Tobacco Co. at Welwyn Garden City, Herts. The move is to begin in September and to be completed by the end of the year.

Polycell make a range of cellulose adhesives, fillers, paint stripping and other preparations.

British Celanese Toluene

British Celanese Ltd. have appointed L. A. Sim and Co. Ltd., Thanet House, 231 Strand, London W.C.2, as the sales agents for nitration grade toluene. The new aromatic solvents plant at Spondon will be on stream by mid-September (see 'Project News' p. 89) and substantial quantities of toluene will be available for delivery against contract from 1 October.

Swedish P.V.C.

From Guest Industrials Ltd., Raw Materials Division, 81 Gracechurch Street, London E.C.3, comes a pamphlet issued by their Swedish principals, Stockholms Superfosfat Fabriks AB, giving details of the Pevikon range of p.v.c. and copolymers manufactured by Fosfatbolaget. The pamphlet includes a discussion on the theoretical relationship between Fikentscher 'K' value and relative viscosity at different solution concentrations.

Changes of Name

British Ratin Co. Ltd., Felcourt, East Grinstead, have changed their name to Rentokil Group Ltd.

Gee Lawson Trading Co. Ltd., 6/8 Sackville Street, London W.1, have changed their name to Gee Lawson Chemicals Ltd.

Despo Manufacturing Co. Ltd., 77 St. Johns Court, Finchley Road, London N.W.3, have changed their name to Despo Chemicals Ltd.

Aluminium Directory

A new edition of the Aluminium Development Association's 'Directory of members with index of products' has been issued. The publication is now divided into two parts, the first being an index of products, whereby a user of

aluminium requiring it in a particular form—e.g., castings, sheet, foil, sections, wire—is given on sight the names of member companies supplying aluminium in that form and is referred by page number to the second part of the book in which the full particulars (name, address, Sales Offices, etc.) of corresponding member companies are set out.

Copies of the publication are available, without charge to *bona fide* enquirers, from the Aluminium Development Association, 33 Grosvenor Street, London W.1.

Fabspray Colours

Mayborn Products, producers of Dylon home dyes, are to market Fabspray home decorating colours for the spray colouring of upholstery, carpets, curtains, etc., produced by Nu-Color Corporation, U.S. This is part of a \$1.2 million contract concluded between the two companies through the recently opened United States Trade Centre in St. James's Street, London S.W.1.

Cockroach Control

Latest addition to Disinfestation's library of pest control films is a 16 mm. colour and sound film on cockroach control called 'The Intruders'. Made by the company's own Felcourt Film Unit, the film shows how these pests infest premises and how they can be eradicated by modern techniques. Lectures and film shows can be arranged through the Pest Advisory Centre, 16 Dover Street, London W.1.

Reinforced Plastics Conference

The British Plastics Federation announces that the third International Reinforced Plastics Conference will be held in London on 28, 29 and 30 November 1962. Previous conferences organised by the Federation were held in Brighton in 1958 and in London in 1960.

The organising committee is now inviting the submission of papers for the conference and will welcome suggested titles, with short synopses, for consideration. These should be sent to The British Plastics Federation, 47-48 Piccadilly, London W.1.

Dithane Suppliers' Potato Guide

The first comprehensive guide to the potato grower—the 'Potato Growers' Handbook', by Dr. D. G. Hessayon (Pan Britannica Industries Ltd.) and Mr. P. G. Fennemore (Charles Lennig and Co.)—has just been published. Costing 3s 6d, it has been sponsored by three companies—Pan Britannica Industries Ltd., Shell Chemical Co. Ltd., and J. W. Chafer Ltd., who are, together, the U.K. distributors of American Dithane.

Obituary

Mr. Norman Ellse, who retired last month from the position of sales manager of Sandoz Products Ltd., died suddenly on 6 July. He was taken ill while driving his car in Yorkshire, and collapsed and died in the car.

Market Reports**CRESYLIC ACID IN GOOD REQUEST**

LONDON New business in industrial chemicals has been mostly for spot on nearby requirements, while contract delivery specifications have been somewhat curtailed by the proximity of the annual holiday period.

Supplies for the most part are fairly easy and prices generally unchanged and steady. Copper sulphate is lower at £78/ton less 2% f.o.b. Liverpool. In the fertiliser market conditions remain quiet.

Firm price conditions have been reported for most of the coal tar products, with cresylic acid in good request.

MANCHESTER Trading conditions have been fairly active in spite of the fact that actual consumption of textile bleaching, dyeing and finishing chemicals, as well as of other industrial descriptions, continues to be seasonally affected by holiday stoppages. There is a reasonably steady call for the alkalis and for the magnesium and barium compounds, while a fair movement of supplies has been reported in alum, ammonium sulphate and formaldehyde.

Hydrogen peroxide, glycerine, borax and boric acid are in steady request. With few exceptions, quotations are fully maintained.

SCOTLAND Reasonable activity is reported in most sections of industry.

Demands were quite brisk and did show some increase towards the latter part of the week. This could be due to an endeavour to get production programmes completed before the start of the holiday period.

Most of the general heavy chemicals, caustics, hypos and acids featured well. Prices on the whole were steady. The market for agricultural chemicals was very much quieter.

O.C.C.A. Exhibition

Preliminary arrangements for the 14th Technical Exhibition of the Oil and Colour Chemists' Association have been completed. The exhibition will take place from 26 February-1 March 1962 in both the Old and New Halls of the Royal Horticultural Society, London S.W.1, on the theme of technical advances in industries supplying the paint, varnish, printing ink, linoleum and other allied industries.

Overseas as well as British firms and organisations will be invited to exhibit. Further information about the exhibition can be obtained from Mr. R. H. Hamblin, General Secretary, O.C.C.A., at West Chandlers' Hall, Gresham Street, London E.C.2.

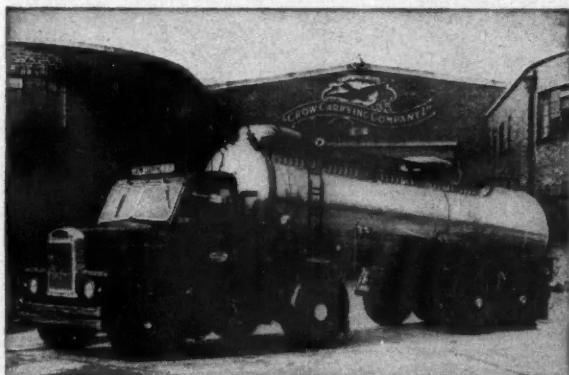
Arthur D. Little Publish 'Acorn' Lectures

In January 1958 the first of a series of monthly lectures was held at the Arthur D. Little Research Institute Inveresk, Midlothian, Scotland, under the auspices of the Institute's Acorn Lectures' Committee. So far, 24 lectures have been delivered by experts in a wide variety of fields. In response to requests that the lectures should be made available to a wider field, the first volume of Acorn Lectures has been produced. Among the five lectures selected is 'Petroleum chemicals' Dr. A. McClean, chief research chemist, British Hydrocarbon Chemicals Ltd. The lecture deals with the raw materials used in the production of petrochemical and some of the ramifications of the industry which give it such a diversity.

The other lectures include 'Patterns of free radical reactivity' by Dr. C. H. Bamford and 'Recent trends in tin research' by Dr. E. S. Hedges.

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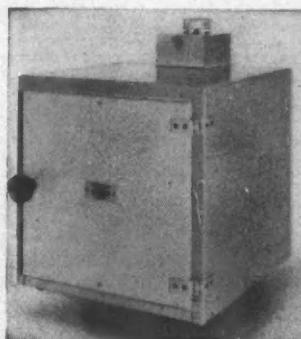


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Specifications filed in connection with the acceptances in the following list will be open to public inspection on the dates shown. Opposition to the grant of a patent on any of the applications listed may be lodged by filing patent form 12 at any time within the prescribed period.

AMENDED SPECIFICATIONS

On Sale 3 August

Steroids. Laboratoires Francais de Chimio-therapie. 816 989
Preparations containing benzoxathial derivatives for the care of the hair and skin. Thomas, Dr. K., GmbH. 823 251

ACCEPTANCES

Open to public inspection 10 August

Process for transfer of heat by means of organic liquids. Shell Internationale Research Maatschappij N.V. 874 860
Cobalt-containing hydrogenation catalysts and the production of same. Badische Anilin- & Soda-Fabrik AG. 874 861
Insecticidal and acaricidal powders. Farbenfabriken Bayer AG. 874 488
Manufacture of 2-hydroxynaphthalene-3-sulphonic acid and certain salts and amides thereof. Farbenfabriken Bayer AG. 874 567
Process for producing diphenylamine. American Cyanamid Co. 874 863
Process for the production of cyclohexanone. Badische Anilin- & Soda-Fabrik AG. 874 864
Process for the manufacture of isoprene from 4,4-dimethylmethadioxane. Institut Francais du Petrole des Carburants et Lubrifiants. 874 569
Production of fluorocarbons. Du Pont de Nemours & Co., E. I. 874 865
Thiophosphoric acid esters. Farbenfabriken Bayer AG. 874 570

Process and apparatus for producing cement of low alkali content. Polysius GmbH. 874 818
Recovery of 1,1-dichlorethane from catalyst-containing compositions. Columbia-Southern Chemical Corp. 874 562
Process for the production of spheroidally-shaped polymer particles. Dow Chemical Co. 874 576

Unsaturated hydrocarbon oils. Esso Research & Engineering Co. 874 577
Insecticidal compositions comprising a vinyl ester of a pentavalent phosphorus containing acid and a synergist therefor. Shell Internationale Research Maatschappij N.V. 874 579
Process for the preparation of fluoro-olefins. Du Pont de Nemours & Co., E. I. 874 867
Process for the production of L-malic acid. Kyowa Hakko Kogyo Co. Ltd. 874 880
Steroid compounds and processes for their preparation. Laboratoires Francais de Chimio-therapie. 874 779
Process for preparing esters of epoxidised hydrocarbon drying oils, and resulting products. Glidden Co. 874 868

Anthraquinonoid dyestuffs. Imperial Chemical Industries Ltd. [Addition to 781 930.] 874 598
Bis(hydroxynaphthylmethyl)-alkylphenols and their use as antioxidants for fats. United States Rubber Co. 874 869
Production of steroid compounds. Laboratoires Francais de Chimio-therapie. 874 781
Method for the production of ketosteroid compounds. Soc. Farmaceutici Italia. 874 572
Process for the manufacture of unsaturated alcohols and acyl derivatives thereof. Hoffmann-La Roche & Co. AG, F. 874 581
Preparation of polyesters. Hercules Powder Co. 874 582
Purification of alcohols. Esso Research & Engineering Co. 874 583
Polynuclear quinone derivatives. Farbenfabriken Bayer AG. 874 770
Stabilisation of polyvinyl chloride. Metallgesellschaft AG. 874 574
Process for the manufacture of alkyl aryl hydrocarbons. Continental Oil Co. 874 584
Carbamates of 5,5-bis(hydroxy-methyl)-1,3-dioxan substituted in the 2-position. Soc. d'Exploitation des Laboratoires Bottu. 874 774
Basic ethers and a process for the production thereof. Boehringer & Soehne GmbH, C. F. 874 575
Production of alpha-monochlorocarboxylic acids. Badische Anilin- & Soda-Fabrik AG. 874 449
Transalcolysis of aluminium alkoxides. Continental Oil Co. 874 585
Process for the production of cyclopropane derivatives and resultant decomposition products. Shell Internationale Research Maatschappij N.V. 874 776
Steroid compound and processes for its production. Laboratoires Francois de Chimio-therapie. 874 781
Antibacterial agents. Beecham Research Laboratories Ltd. 874 414, 874 415, 874 416
Purification of carbon tetrachloride. Food Machinery & Chemical Corp. 874 607
Cyclododecadiene diols and their preparation. Usines Chimiques Rhone-Poulenc Soc. des. 874 418
Production of cyclododecene. Chemische Werke Hüle AG. 874 419

Open to public inspection 16 August

Hydroxyflavones, their production and use as anti-oxidants. National Research Development Corp. 875 164
Fire-resistant compositions containing bromine-containing tricresyl phosphate. Dux Chemical Solutions Co. Ltd. 874 905
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Modified synthetic addition polymers. Du Pont de Nemours & Co., E. I. [Addition to 820 120.] 875 131
Sheets and foils of linear crystalline polyolefins. Montecatini. [Addition to 810 023.] 875 132
Process for the cyclic production of hydrogen peroxide. Edogawa Kagaku Kogyo Kabushiki Kaisha. 875 189
Manufacture of polysulphonamides. Imperial Chemical Industries Ltd. 875 067
Alcoholic solutions of polysulphonamides. Imp-

erial Chemical Industries Ltd. 875 070
Manufacture of aromatic polysulphonamide filaments and the like. Imperial Chemical Industries Ltd. 875 071
Process for the polymerisation of olefins. Ruhrchemie AG. 875 073
Adducts of heterocyclic amides and thioamides with α,β -unsaturated compounds. Rohm & Haas Co. 875 134
Methods for preparing stable aqueous dispersions of cellulose and applications for coating products such as glass products. American Viscose Corp. 874 945
Crystallisable compounds, particularly for use as catalytic agents and process for their preparation. Montecatini. 875 078
Stabilisation of halogen-containing macromolecular compounds and resulting stable products. Geigy AG, J. R. 875 017
Process for the reaction of primary and secondary amines and also hydroxy- and polyamines with formamide or formamide compounds. Leuna-Werke W. Albrecht Veb. 875 356
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Production of unsaturated aldehydes. Distillers Co. Ltd. [Addition to 694 356.] 875 160
Rapidly hardenable compositions of epoxy resins and polyamide resins. Ciba Ltd. 874 970
Production of polymers. Celanese Corp. of America. 874 893
Process for the manufacture of salt mixtures for the electrolytic production of magnesium. Knapsack-Griesheim AG. 874 974
Succinimides and process for their manufacture. Ciba Ltd. 875 023
Hydroforming processes employing alumina catalysts. Esso Research & Engineering Co. [Addition to 792 806.] 874 894
Production of allene and/or propene. Nederlandse Organisatie Voor Toegepast Natuurwetenschappelijk Onderzoek Ten Behoeve Van Nijverheid, Handel en Verkeer. 875 195
Alkyl and/or aralkyl substituted aromatic ethers. Monsanto Chemical Co. 874 979
Process for the preparation of vitamin B₂. International Hormones Inc. 875 400
Quinoline derivatives. Imperial Chemical Industries Ltd. 874 980
Production of polymers from monomeric epoxy compounds. Petrochemicals Ltd. [Addition to 785 053.] 875 161
Production of co-polymers from monomeric epoxy compounds. Petrochemicals Ltd. [Addition to 793 065.] 875 162
Producing alkyl isophthalates or alkyl terephthalates. Distillers Co. Ltd. 875 041
Preparation of sulphur halogen compounds. Imperial Chemical Industries Ltd. 875 209
Composition containing gibberellic acid. Uclaf. 874 982
Hydrazinium salts. Grace & Co., W. R. 875 007
Organosilicon resins. Midland Silicones Ltd. 875 109
Liquefied gas vaporisers. Union Carbide Corp. 875 200
Process for the production of chromium trioxide. Farbenfabriken Bayer A-G. 875 111
Densification of nitrocellulose. Hercules Powder Co. [Addition to 827 012.] 875 112
Anti-foam agents. Fabriques de Levure, Sucre & Alcools de Saint-Ouen-l'Amoune. 875 113
Preparation of dispersions of barium hydroxide in non-volatile solutions of barium sulphonate. Continental Oil Co. 875 044

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Continued from page 110

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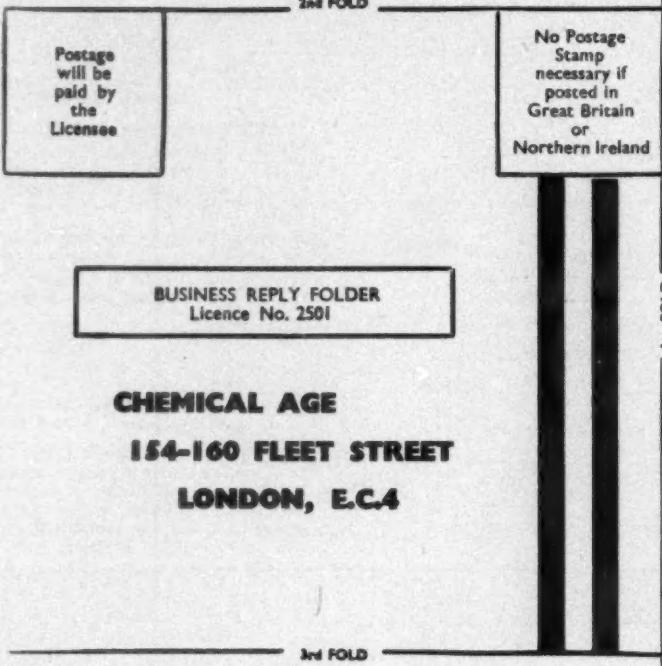
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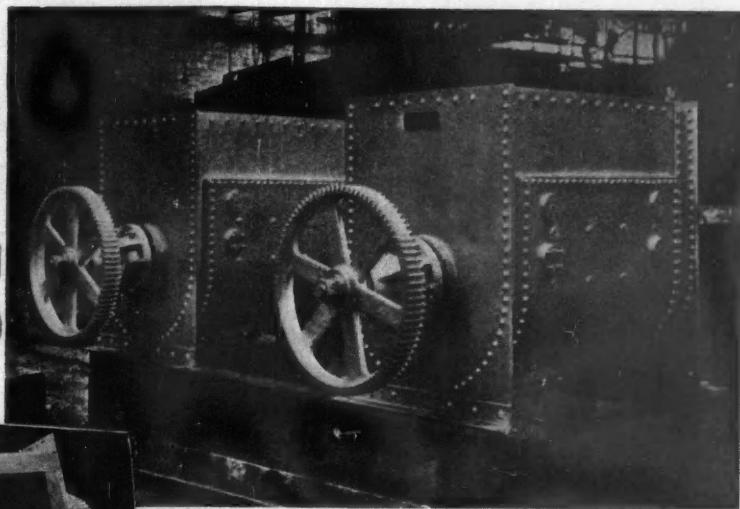
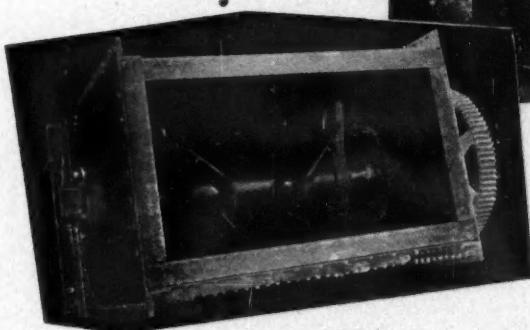
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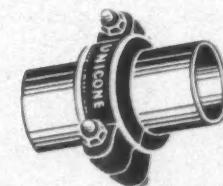
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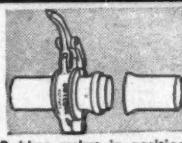
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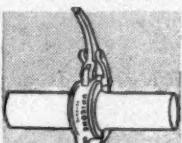
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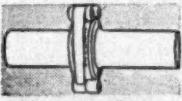
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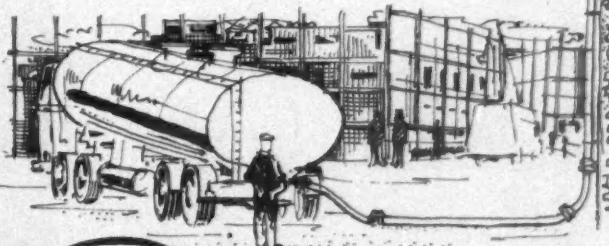
The completed joint.

For temporary pipe lines 'Unicone' Instantaneous joints are recommended. Comprising two parts only, they fasten with a "snap" ensuring a perfect seal in a matter of seconds.

For permanent or semi-permanent pipe lines, 'Unicone' bolted type joints are usually employed and can be assembled far more quickly than any other flexible joint giving positive anchorage.

A perfect joint in a matter of seconds...

The 'Unicone' system of pipe-jointing, with its time and labour saving features, produces a pipe line which is flexible while remaining absolutely leak-proof.



THE UNICON CO., LIMITED
RUTHERGLEN, GLASGOW, SCOTLAND

Recovery of ferrous sulphate heptahydrate

The vacuum crystallization process for the regeneration of pickle liquor offers outstanding advantages for a very wide range of pickling capacities at a ferrous sulphate content of 12 to 15% and higher and at appropriate sulphuric acid concentrations.

Continuous operation

Uniform, low ferrous sulphate content in regenerated liquor independently of possible variations in the cooling water and air temperatures during the seasons

Low energy requirements

Steam saving because of heat exchange

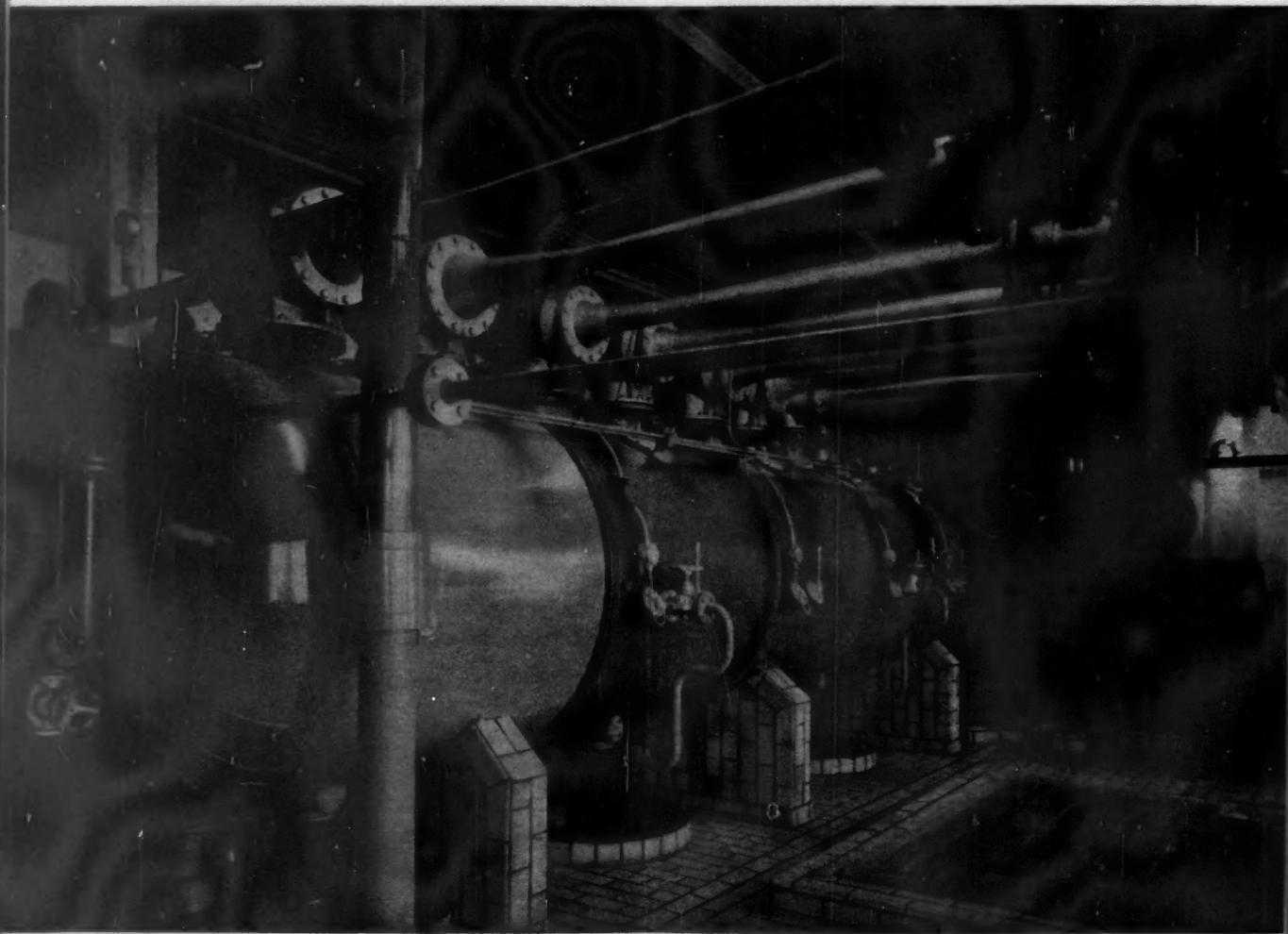
Simple and trouble-free operation over long periods

Low maintenance cost

No loss of acid

Lurgi has been handling the design and construction of pickle liquor regeneration plants for more than 35 years.

Pickle Liquor Regeneration by Vacuum Crystallization



Vacuum crystallizer in regeneration plant for a maximum pickling capacity of 40,000 tons per month of strips

**LURGI GESELLSCHAFT FÜR WÄRMETECHNIK MBH
FRANKFURT (MAIN) · LURGIHAUS**

W 410

Associated Lurgi companies:

Lurgi Apparatebau Gesellschaft mbH
Lurgi Gesellschaft für Chemie und Hüttenwesen mbH
Lurgi Gesellschaft für Chemotechnik mbH
Lurgi Gesellschaft für Mineralöletechnik mbH

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